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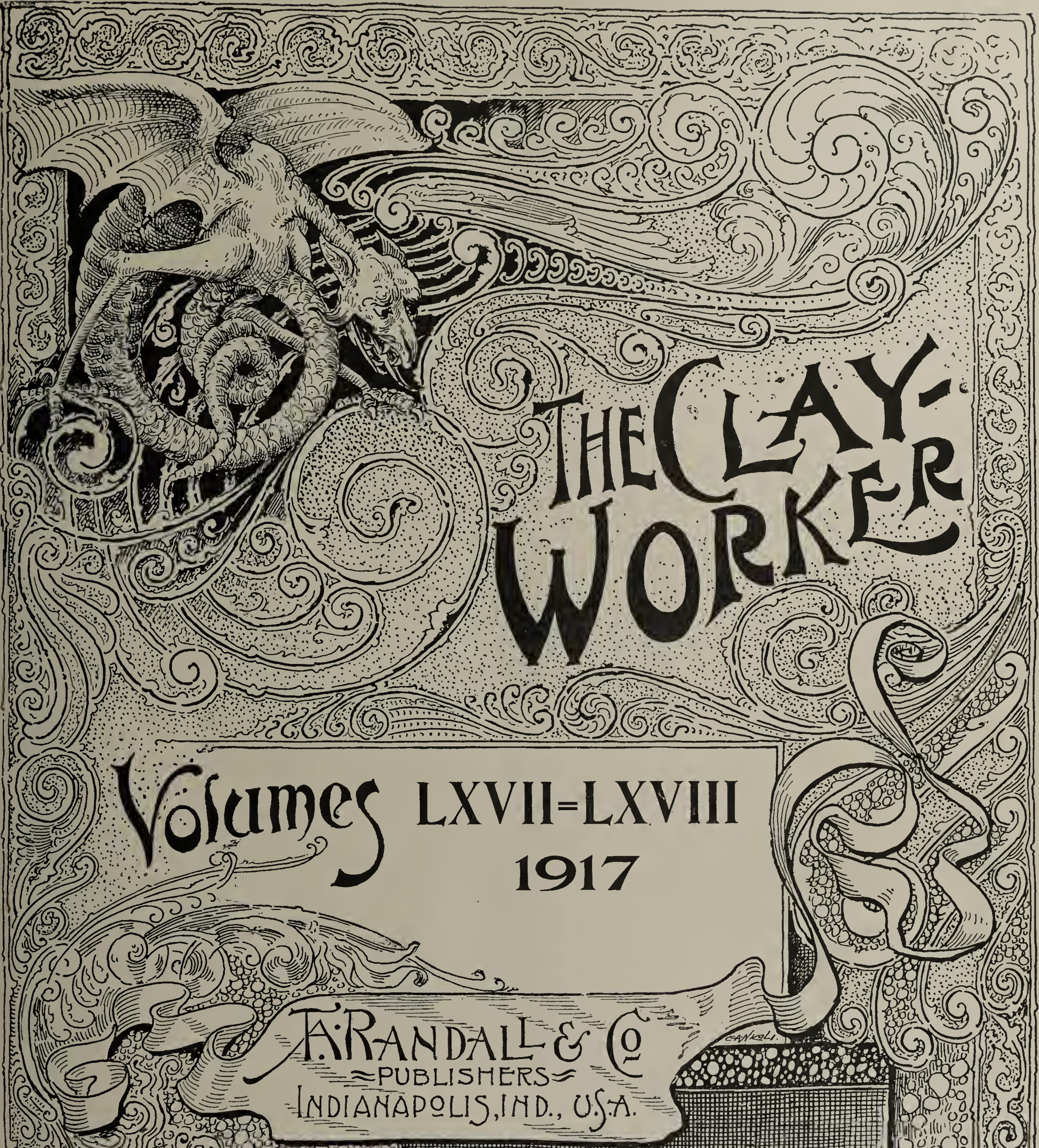

THE CLAY-WORKER

Volumes LXVII=LXVIII
1917

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Engineering Library

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THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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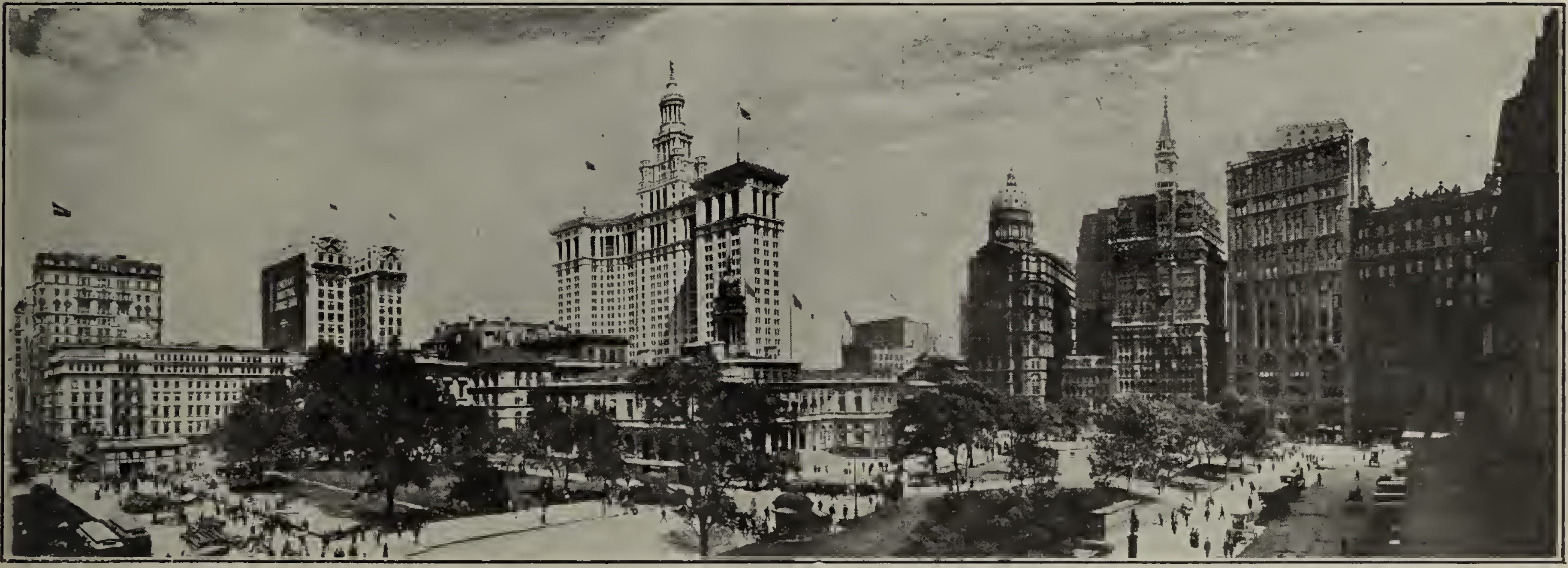
THE CONVENTION CITY

Some of the Many Interesting Things About New York Which Have Made it the Most Popular Convention City in the World.

NEW YORK CITY where the next annual meeting of the National Brick Manufacturers' Association is to be held, March 5-10, 1917, had 663 conventions last year.

This is the largest number of conventions that ever have been held in a city in a year, with the exception of San Francisco in the year 1915, when the Panama-Pacific Exposition was in progress. About 700 conventions met there in that year. A considerable proportion of them being special or adjourned meetings which met in order to give the delegates a chance to see the fair.



New York City Hall Park, With the Skyscraping Municipal Building Towering in the Background.

The number of delegates who visited New York in order to attend conventions last year was about 600,000, including both men and women.

New York City is the leading convention city of the world.

Delegates like New York because, in the first place, it is possible for business men, who compose the majority of delegates to conventions, to do business there; and if they can not do business, they can and do derive a profit from examining the latest method, the newest machinery, and the most modern appliances in their different lines.

There is something in New York for everybody.

Its population is made up of the most diverse elements. It has 723,333 persons of German birth, 674,721 of Irish blood, 543,437 Italians and 306,422 persons of Austrian descent.

The official estimate of the city's population on December 31, 1916, as announced by the Federal Census Bureau was 5,602,841.

New York increases in population so rapidly that it takes to itself every four years a sufficient number of inhabitants to make a city the size of Boston or St. Louis.

New York, in effect, is composed of five great cities, Manhattan is larger than Chicago. Brooklyn is larger than Philadelphia. The Bronx is as large as Detroit. Queens is larger than Minneapolis. Richmond is larger than Salt Lake City.

New York has banking resources of $6,072,506,075.

New York has 38,000 factories, employing $1,800,000,000 of capital, annually turning out products valued at $2,900,000,000, and giving employment to 810,000 persons who receive $540,000,000 each year in salaries and wages.

New York Savings Banks have deposits amounting to $1,231,202,000.

New York erects a new building every fifty minutes.

New York gives welcome to a new baby every four minutes.

New York has 1,730 miles of street car tracks, and moves 4,967,680 persons every day on a five-cent fare.

New York is the world's greatest port. Its annual incoming and outgoing tonnage is 27,223,000.

New York has 198 parks, with 8,615 acres, 98 playgrounds and 13 free beaches.

New York has thirty-one independent post offices; 4,626 letter carriers.

New York may be said to be the termination of every

American railroad. Each day 290,000 persons enter and depart from the city on passenger trains.

New York has 3,087 miles of water pipe, and 170,000,000,000 gallons of water stored in its reservoirs.

New York has 1,500 hotels, which accommodate 150,000 transients.

New York has more than 1,000 theaters, large and small,

New York has 771 miles of water frontage, of which 395 miles have been developed.

in which more than 500,000 persons are entertained at least once a day.

New York has 1,525 church edifices, and in its congregations are 1,709,241 communicants.

New York has 802,573 pupils registered in its 553 day schools, with 20,063 public school teachers.

New York has 102 hospitals, in which 21,858 patients can be cared for.

New York City is of special interest to the members of the Brick Manufacturers' Association and allied trades, because of its enormous building operations. The brickyards along the Hudson River, which send their product, together with the product of the cement plants upon the river down to the city in barges are famous throughout the country.

The brick, tile, pottery and clay product manufactures in the city was carried on by fifteen separate establishments in 1914, when the last Federal Census of industry was made. The value of their product was $1,360,000 or only a small fraction of the city's consumption.

With its wonderful skyline, shifting almost as rapidly as clouds, New York is building and rebuilding in a manner that astonishes even those who knew it best. Where yesterday stood a stunted ten-story structure, today a building of forty or fifty stories houses hundreds of business establishments or gives office room to thousands of professional men. It has been said that it requires only fifty minutes to erect a building in New York—an exaggeration, of course, and yet so energetic are builders that a new structure is completed on an average every fifty minutes of every day of the year.

Before discussing the varied aspects of New York's facilities and advantages, it is well to submit some comparative figures. Last year three hundred and ninety international, national, interstate, and New York state organizations held conventions in New York City with an average attendance of over one thousand persons. Only one city in the world has ever exceeded this record. Chicago, last year, had four hundred and forty-four conventions. During the month of January, New York had sixty-nine conventions. This is said to be the largest number ever held in any city in one month.

In it hotels are spacious meeting rooms and halls, seating from one hundred persons up to as many as three thousand. The extent of the latter may be realized when one recalls the fact that the great Metropolitan Opera House seats thirty-three hundred persons. In one New York hotel is as much space for meetings and exhibitions as practically all Chicago's hotels combined, or more than Boston's, Philadelphia's, and Washington's hotels combined.

From figures compiled by The Merchants' Association, it has been demonstrated that every gathering held in New York during the past two years has had an attendance from ten per cent to as much as five hundred per cent. larger than when held in other cities. Than this, no more powerful argument could be offered.

For information relative to the coming N. B. M. A. Convention to be held in the McAlpin Hotel, March 5 to 10, 1917, see official announcement on another page of this magazine.

The man with a hobby is always an interesting citizen and he is valuable to his community in proportion to the merits of the hobby he rides.

Written for The Clay-Worker.

NEW YORK AND VICINITY.

CONDITIONS IN THE general brick situation have hung over from the previous year and seem unlikely to change materially for the present. The high price paid last year is continued, and those builders who are looking for material to use in finishing operations already begun are forced to pay the highest prices. Quotations run as high as $10.50, and some have asked as high as $11.50 to $12.00 for Hudson common. It is possible to buy at $9.50, and in one or two instances sales have been made even lower than that; but in the main these high figures prevail.

Thus far the market has not been shortened up as seriously as it is some winters because the Hudson is not closed. Boats can still go and come. A little ice formed, but disappeared, and at no time has it been serious enough to stop the operation of boats if makers so desired. Most buyers are satisfied with small lots at the moment, though the generally high temperatures permit building operations to continue, even though the time for closing is past. As long as building continues dealers will have to furnish brick, but the quantity wanted is by no means as large as it is during the summer.

New York Municipal Building in Which Practically All of the City Officials Are Domiciled.

Many manufacturers are in position to operate their plants profitably all the winter so far as orders are concerned, but it is almost impossible to secure help. Men will not work in brick yards when they can obtain employment which is more profitable elsewhere. Southern labor was the only solution of the problem during the summer, but Southern labor will not work in this latitude in winter. As soon as the first breath of winter touched them they fled South, and no amount of persuasion or offers of larger pay availed to induce them to stay. They were fearful of the cold weather and refused to consider further engagements, at no matter what price. A good many yards were left with insufficient men and were forced to resort to numerous makeshifts to close their business for the season. The cost was severe in some instances and the profits were reduced, but that didn't matter. It had to be done. Perhaps some will not reopen in the spring unless these problems can be more satisfactorily adjusted.

When asked what he thought about the possibilities of the coming year a man in close touch with the building situation in and about New York declared very emphatically that he thinks 1917 is to be one of the best brick years ever known. He doesn't think cement is going to cut much figure in the better class of buildings, though factories, stables and garages will still be constructed of cement and concrete and it is to be extensively utilized in foundations, as it should be. But for really worth while construction cement is losing its attractiveness in New York. He said that unquestionably the coming year will see a larger development of a certain type of business buildings than for many years, and he is confident that these are to be wholly of brick. The use of terra cotta, fireproofing and other varieties of burned clay is to increase even faster than it has in the past. Those who pay for structural work are only now realizing the value of this type of material. For these reasons he is confident that 1917 will be a notable year. In discussing this enlarged use of burned clay he pointed out that New York is only living up to its traditions and is continuing a burned clay city, as it always has been.

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View from City Hall, Park, Showing the Woolworth Building, the Tallest in the World.

The total number of dwellings erected in Greater New York during 1916 ran up to 11,650, to be occupied by 115,000 persons, and they cost $32,610,000. Few realize how many dwelling houses are needed in New York. When they think of the city they see only the 3,500,000 flat dwellers and reason that dwellings are now no longer known. The brick man is interested because this number represents a fair average of those erected each year, and most of them are of brick, including more or less fireproofing and often a considerable amount of terra cotta in decorations. The coming year promises to see even larger numbers of brick buildings erected.

The Garner Brick works at Haverstraw have done a large business during the year just passed. They are equipped to turn out 40,000 a day, and every day they could obtain sufficient help they made that amount. John Peck, the active superintendent of the plant, is one of the best brickmakers along the Hudson, and the way he secures full efficiency from his equipment is a study in operation well worth seeing. The firm has taken a number of important contracts during the year. At one time N. H. Sloan, of Paterson, N. J., one of their hustling representatives, was taking nearly thee-fourths of their entire output. To be able to compete with New Jersey makers on their own ground and ship the brick by rail was a feat which deserves commendation.

BURTON.

THE WORLD'S TOWER BUILDING.

NEW YORK has numerous large and some extraordinary buildings, but the World's tower building, erected by Edward W. Browning at 110-112 West Fortieth street, is unique. In order to make this plain it will be well to enumerate some of its unusual features:

It is the tallest office, loft, show room or studio building ever erected upon this size plot.

It has the greatest number of stories of any kind of building ever erected in the world for the area of ground upon which it stands.

It has the greatest gross and net floor area in the world of any building covering the same size plot.

It is the only office, loft, show room or studio building in the world having all four sides richly ornamented in white glazed terra cotta, with windows in gold.

It has the best light and air in proportion to size of any building in the world.

It is one of the few buildings in the world which has not one particle of wood, fireproofed or otherwise, in any part of its construction.

The tallest office, loft, show room or studio building in the world for the width of plot, and it holds the record for the number of stories to the width of plot.

It was the first building in the world of its height having an absolutely fireproof and smokeproof tower connecting at the bottom with the street, with entrance from the exterior.

It is the tallest building in the world of any description ever erected upon a side street. It also has the greatest electric display around the tower in proportion to the size of the roof.

It is the only office and store building ever erected having every suite of offices above the fifth floor all corner suites; all elevators in the center and windows all around on all four sides.

It has the greatest number of windows of any building in the world in proportion to its size.

It has more windows than any other building in the world of any description ever erected in proportion to the area of ground the building covers.

These are claims of the owner and an examination of the building will go far toward convincing the visitor that the claims are well founded. It is also unique in that it is pure white, the terra cotta being enameled and appearing in the sunshine like crystal ice. The Federal Terra Cotta Company is responsible for this part of the structure and right well did the company do its work. Indeed, it would be difficult to imagine anything more striking or beautiful than this structure.

The architects were Frewere, Beckwith & Fox, and they succeeded in evolving a structure which will afford ground for much consideration among other architects who may have similar problems to work out in the future. It is a successful solution of the problem of erecting a high office building upon a small plot and making it not only striking, but effective and economical. Besides, the architects have developed a floor plan which affords the maximum of light and air with the minimum of space. And the success which has attended their efforts will, no doubt, encourage a more thorough study of the problems which similar structural work presents in New York.

New York City Hall Surrounded With Modern Skyscrapers Built With Brick.

It is twenty-six stories high and covers a plot approximately 50x100 feet. It offers unequaled facilities for any business concern which wants to secure a headquarters so unique that the name and appearance of the building will constitute an advertisement.

It is situated on West Fortieth street, just west of Sixth avenue, and east of Broadway. It is about equally distant from the Grand Central and Pennsylvania railroad terminals and in the midst of New York's newest and high-class office structures. It is entirely surrounded by subways elevated roads, surface roads and is not far from the entrance to the Manhattan tubes. Later it will be within two blocks of a station of that road. The great hotels are near, the wholesale district for some classes of goods is in that vicinity and there are numerous other enterprises and attractions which call thousands of people to that locality at some time during the twenty-four hours.

The foundations are twenty-four piers carried forty feet to solid rock in caissons and the building itself is rigidly constructed. But what is perhaps a more important guaranty is that it was built for a permanent investment for its owner, not for speculation, and every tenant will understand the difference immediately. Indeed, it would be difficult to find a building in which those elements most required are combined more harmoniously.

Edward W. Browning, the owner, is a live wire in the real estate world of New York and owns a number of modern structures which hold records for convenience of patrons. He has had this one erected to develop some preconceived notions of his regarding the possibilities of an office building upon a small plot and those who have seen it are ready to agree that he has solved those problems with marked success. Indeed, it may be stated that in certain directions he has the most remarkable building in New York and its construction marked a new era in the erection of office buildings upon small plots. As a pioneer in this sort of work, Mr. Browning deserves the success which has attended his efforts.

BURTON.

Reduced
Railroad
Rates
Granted by
The Trunk Line
and Central Traffic
Association.

Hotel
McAlpin
Convention
Headquarters.
Broadway
at Thirty-fourth St.
March 5-10, 1917.

OFFICIAL ANNOUNCEMENT.

Reduced Railroad Rates Granted by the Trunk Line and Central Traffic Association.

Thirty-first Annual Convention of the National Brick Manufacturers' Association and Allied Organizations to be Held at Hotel McAlpin, New York, March 5-10, 1917.

AFTER THIRTY YEARS of meandering among the cities of the nation, it has at last been decided to accept the insistent invitation of Father Knickerbocker and hold the thirty-first annual convention of the National Brick Manufacturers' Association in New York City, now the largest city in the world.

It is fitting that the oldest and largest association of clayworkers in the world should meet in the world's greatest metropolis, which awaits with glad hands outstretched to bid a hearty welcome to the makers of the one indestructible building material of which the city everlasting has been builded.

Reduced Railroad Rates.

The Trunk Line Association and the Central Passenger Association have granted reduced railroad rates on the certificate plan on the bases of 2 cents a mile for the round trip for delegates to the national convention and those who accompany them. It is anticipated that other traffic associations will concur and that a special rate will prevail from all points. Tickets will be good going March 3, 4 and 5. Full one way fare must be paid going and certificate taken for same. This, when vised by the secretary and the representative of the Trunk Line Association, will entitle the purchaser to a return trip ticket at the reduced rate. Certificates must be vised during the convention, but the return trip can be made any time prior to March 14.

McAlpin Hotel, Headquarters.

The convention will be held the week of March 5 to 10, 1917, in the famous McAlpin Hotel, which will afford unsurpassed facilities, being the largest hotel in the world, and this, too, is meet and proper, for it is predicted that the attendance at the convention will be the largest in the history of the association. The attractions of New York and its environs, its drives and parks, its statues and museums, art galleries and public institutions, its churches and cathedrals, its unequalled harbor and its several great suspension bridges, its tubes, subways and elevated railway, its great terminal stations, the largest in the world, and its many varied places of amusement, appeal irresistibly to every one.

For these reasons, New York is becoming the greatest convention city in the world. Mr. J. R. Young, secretary of the Convention Division of the Merchants' Association of New York, is authority for the statement that organizations of all kinds are more largely attended in New York City than anywhere else.

Hotel Rates.

The following rates will prevail at Hotel McAlpin during the convention:

Single rooms with running water (baths on every floor, without extra charge): $2.50 and $3.00 per day.

Single rooms with private bath: $3.00, $3.50, $4.00, $5.00, $6.00 and $7.00 per day.

Double rooms with running water (baths on every floor, without extra charge): $3.50 and $4.00 per day per guest; $4.50 and $5.00 per day for two guests; $1.00 per day is added for each additional guest.

Double rooms with private bath (one double bed): $4.00 $4.50, $5.00 $5.50, $6.00 and $7.00 per day. (Two single beds): $5.00 to $7.00.

Parlor, bedroom and bath (either for one or two occupants): $6.00, $7.00, $8.00, $10.00 and $12.00 per day.

The Hotel McAlpin is operated on what is known as the

Lower Manhattan, Seen From the Brooklyn Shore, Showing the Graceful Brooklyn Bridge.

European plan, with the modification that, besides its regular a la carte service, special "fixed price" meals are served: Breakfast at 50 cents and 65 cents, luncheon at 75 cents, and dinner at $1.50. This unique arrangement enables guests who prefer to limit their expenditures to a stated amount per day, to do so, with the added advantage that they are not obligated to pay for any meals they may decide to have elsewhere. In other words, this innovation possesses the merits of the old American plan with none of its disadvantages.

Delegates will find it advantageous to occupy rooms jointly, single beds being provided where so desired, as a much lower rate is obtained that way and a much larger number can be accommodated. The latter is an important feature, for it is anticipated that there will be a record-breaking attendance. Early reservations will prove advantageous. In requesting same, delegates should state time of intended arrival, character of accommodations desired, number in party, etc.

Broadway by Night, View From Top of Woolworth Building, Looking South.

The Complete Home Show.

An unusual attraction convention week will be the Second American Complete Building Show, which will be held in the Grand Central Palace, which affords unequalled facilities for such exhibits. The show will be given under the direction of those who so successfully conducted the first show in Cleveland last winter. The co-operation of the brickmakers of the country is particularly desired, with a view of making the show of utmost value to the building brick industry.

All Allied Associations Will Meet There.

As in former years, the American Ceramic Society, the National Paving Brick Manufacturers' Association, the National Clay Machinery Association, the National Building Brick Bureau, and other allied associations will meet in New York at the same time, and will be afforded unsurpassed facilities for their deliberative sessions and other functions.

The clayworkers of New York and vicinity are heartily in accord with the convention idea, and promise to leave nothing undone to make the meeting most memorable. A program befitting the occasion will be arranged. Members desiring any particular feature of the business discussed at any of the sessions are requested to communicate with the Secretary in regard to same. Those desiring information as to requisite of membership, etc., will please write to the Secretary at Indianapolis, Ind.

THE EXECUTIVE COMMITTEE,
Charles J. Deckman, President.
Theo A. Randall, Secretary.

To be a big man in business is a natural ambition, but to be resourceful and pushing whether your business is big or little is the thing that really spells success.

CONVENTION DATES.

Canadian National Clay Products Association, Royal Connaught Hotel, Hamilton, Ont., Jan. 23, 24 and 25. Gordon C. Keith, Secretary, Toronto, Ontario.

Wisconsin Clay Manufacturers' Association, Republican House, Milwaukee, Wis., Feb. 1 and 2. S. Weidman, Secretary, Madison.

The American Ceramic Society, Hotel Astor, New York City, March 5, 6 and 7. Edward Orton, Secretary, Columbus.

National Paving Brick Manufacturers' Association, McAlpin Hotel, New York City, March 5 and 6. Will P. Blair, Secretary, Cleveland.

National Brick Manufacturers Association, McAlpin Hotel, New York City, March 7, 8 and 10. Theo. A. Randall, Secretary, Indianapolis.

National Clay Machinery Manufacturers Association, McAlpin Hotel, March 8.

Written for THE CLAY-WORKER.

MILWAUKEE AND WISCONSIN BRICK NEWS.

THE CLAY INDUSTRY of this territory is looking forward to a most prosperous 1917. The Christmas season has come and gone, New Year's has been observed, annual inventories completed and plans laid for a bigger and better year of "Building with Brick."

From all indications the clay industry shared liberally in the prosperous conditions which were generally apparent in Wisconsin during the past year. The fact that the public received higher wages and that financial conditions improved to a remarkable degree brought about the consumation of long contemplated plans for various construction work. Industries were able to take up construction work on new factories and additions, which really became necessary because of the growth of business. Individuals who had been planning to build homes were in a position to see their hopes materialize as wages were high and the prospects that conditions had improved to stay were bright. Municipalities took advantage of prosperity and started on improvements in public buildings, streets and roads, sewers, etc. Capitalists were increasing their wealth and invested some of their money in permanent buildings.

In Milwaukee alone more than $16,000,000 in construction work was authorized during 1916. This record is the highest ever established in the metropolis of the Badger state. It is approached only by the records of 1912, one of the best years in the history of the city, during which time the permits were about one million less. About sixty-five permits were issued by the Milwaukee building inspection department during the twelve months just passed, where the amounts reached $20,000 or more. Eleven permits were for buildings costing $100,000 and more. These included the following: Plankinton Arcade, Grand avenue, $1,250,000; Plankinton Hotel, $900,000; Wisconsin Telephone Co.'s new main exchange on Broadway, $700,000; Milwaukee Athletic Club, $700,000; Northwestern Road grain elevator, $750,000; and others ranging in value from $300,000 to $105,000.

The month of January was the largest of the twelve, there having been issued permits for construction valued at nearly $2,500,000. July brought another $2,000,000, while during November the figures reached $2,500,000. May, June and October added more than $1,000,000 each.

The total number of permits issued for construction work was 4,066, for work costing approximately $16,013,194. The various classes of buildings comprising this total are as follows: Fire proof construction, $5,809,846; mill construction, $127,710; veneer and frame construction, $3,981,429; ordinary construction, $2,536,811; additions and alterations, $1,584,369; miscellaneous construction, $1,973,029.

The prospects for construction work during the coming year are exceptionally bright. One of the largest undertakings which will materialize before long is the construction of the new $3,000,000 Milwaukee County Court House. Various industrial and commercial enterprises are preparing plans for large structures. Among the buildings which have been in the hands of architects but on which contracts have not been let are: Natatorium, Hayes and 5th avenues, $60,000; office building for the Cutler-Hammer Manufacturing Co., $150,000; Washington Hotel, $300,000; Davis Street school, (being awarded) $100,000; Hotel Wisconsin Annex, $250,000; Terminal for the Chicago, North Shore & Milwaukee Road, $300,000.

Street and road work throughout the state is taking definite form. During the past year Milwaukee laid a total of 449,505 square yards of new pavement, or approximately twenty-five miles. The repair work amounted to 402,985 square yards, or about twenty-three miles. The 1917 budget appropriated $400,000 for permanent street construction work, but this has been vetoed by Mayor Hoan on account of the high cost of materials and labor. A new resolution will provide about $325,000 for the work. At Tomah, Wis., fifteen blocks on McLean avenue and Washington street are to be paved with vitrified block, and the Superior avenue brick pavement extended to the city limits.

The present expenditures for rural roads and bridges are more than $10,000,000 a year, according to the annual report of the Wisconsin State Highway Commission. Of this sum $4,500,000 is provided under the state aid law and is expended under the supervision of the commission and county officials, and about $1,000,000 is spent on county aid bridges. The remaining $4,500,000 is expended under the direction of the town boards in the state almost wholly for maintenance, producing no permanent betterment. If present expenditures are continued, under present methods and laws, $80,000,000 will have been expended in the next eight years and at the end of that period the 61,000 miles of town road will be little improved over their present condition, the report continued. The commission advocates that one-tenth of the road system be properly built each year and then maintained, instead of doing the work over and over again as at present.

Milwaukee will spend $1,460,000 for new sewers in 1917, if present plans of the sewerage commission materialize. A bond issue will be necessary for the work. There are approximately 154 publicly owned and a few privately owned sewerage systems in the cities and villages of Wisconsin. There remain many communities, lacking such improvements, which are large enough to maintain public sewerage systems. New sewerage systems and extension of old contemplated in 1917 will bring a large volume of business to manufacturers and dealers in clay sewerage products.

The Ringle Brick Co., of Wausau, Wis., is increasing the capacity of its plant at Ringle, near that city. Foundation walls of brick have been built around the present brick and frame building, which will be removed when the new solid brick building is completed. The concern is also installing an improved brick making machine which will increase the capacity 1,000,000 brick per season and increasing the annual output to 5,000,000 brick. Work on construction and the installation of the new machinery has been in progress for several weeks.

The Burlington Brick & Tile Co., at Burlington, Wis., closed down operations at its plant during the latter part of December after a good season's run. A. BADGER.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART VIII.

Burning Behavior of Clays (Continued.)

No. 8 illustrates the behavior of two clays. The upper curve is that of a sandy red clay which shrinks 1 inch up to cone 04, but at higher temperatures up to the limit of the test there is no further change. The product is all soft, all light red and all porous. This clay will not produce satisfactory ware except at temperatures above cone 7, and at such higher temperatures the fuel cost in burning becomes considerable.

The lower curve shows an exceptional clay. At cone 07 the shrinkage is over 6½ per cent. We wonder at how low a temperature the shrinkage began and what was the rate of shrinkage. It will be noted that at cone 07 the shrinkage was stationary, and remained so up to cone 04. If it is stationary several cones below cone 07, what a remarkable material it would be for fire-proofing—in that the product would be hard, in that the temperature of burning low and the fuel consumption light, in that the ware would be absolutely the same size, and in that the burning range is exceptionally long.

Above cone 07 the shrinkage is only 1½ per cent. up to cone 7, and we do not need to consider temperatures below cone 07 to show the excellence of the material.

Vitrification began at cone 1 and there was not the slightest evidence of failure up to cone 7.

Even though cone 7 should prove to be the limit, yet a clayworker would be content with a vitrification range of six cones.

No. 9 presents nothing new except the sudden drop in the curve at cone 04, which one might assume marks the development of a fusible eutectic mixture.

Ordinarily a sudden drop at such an advanced stage in the shrinkage would indicate that the failure point was being approached, but the eight subsequent cones did not develop any failure.

No. 10 is a characteristic behavior of a limey clay. Some begin shrinking at lower temperatures and do not shrink as much as the clay illustrated, although the high shrinkage is not unusual. The feature of the curve is the very rapid shrinkage and the very sudden change at the failure point. The change is usually so sudden that it is impossible to get a measurement after the fusion begins. The burning range for this clay will be between cone 1 and cone 5, but it is doubtful if a satisfactory range for an all-hard product is possible. It would be necessary to stop the advance of the temperature before cone 5 was reached, and it would require a temperature above cone 1 to insure hardness. The safe burning range reduces to a minimum.

No. 11 is an entirely different material. It is a clay low in iron and contains no lime. The shrinkage begins below cone 07, and the samples are steel hard at this temperature. At cone 1 the vitrification is practically complete, but there is no failure even up to cone 7, and likely above. There is a vitrification range of six cones and probably more, and a burning range of thirteen cones and more.

The curves show the wide variation in the burning behavior of clays, and they also show how futile are conclusions drawn from any single sample test, which would give a result for only one temperature.

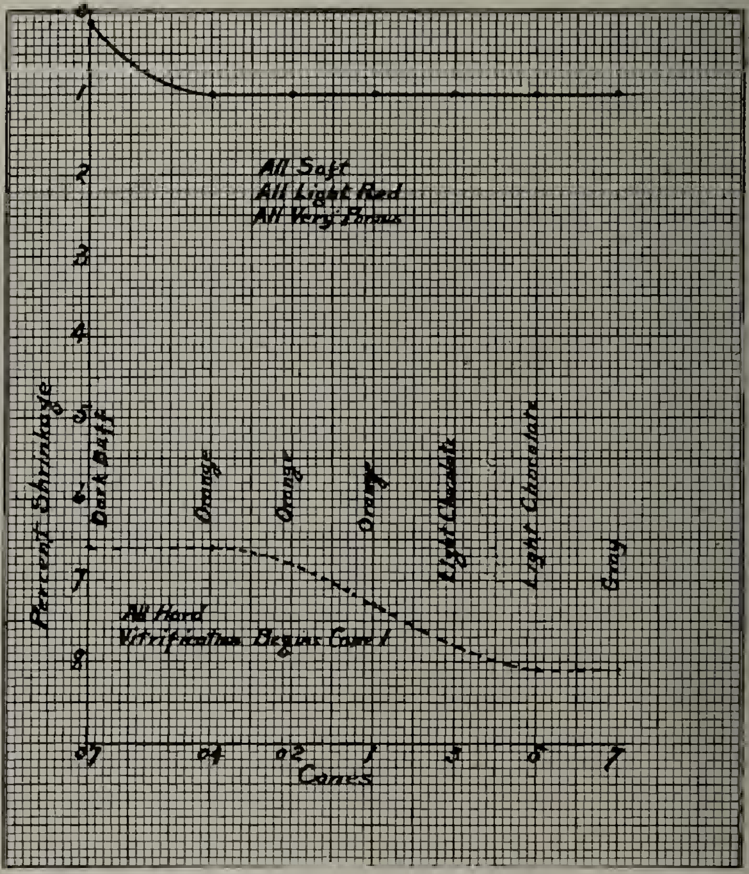


Figure 8.

Many clays will produce good wares if burned to just the right temperature, but they may or may not produce good wares at other temperatures, upon the possibility of which depends the commercial value of the clay.

We must have not only a good quality of ware, but also a satisfactory range of practically equally good quality; we must have a good color and also a satisfactory color range;

uniformity in size is important, and this requires a slow rate of shrinkage within the temperatures producing good quality wares.

Salt Glazing.

Salt glazing was not given as a burning stage but it may very properly be included. The ware is salt glazed during and following the vitrification period.

It is essential that some degree of vitrification be obtained before salting begins otherwise the glaze will be absorbed into the body of the ware and a satisfactory surface glaze would only be possible after the pores of the ware were filled which would require an excessive amount of salt and a long firing period during the salting. A salt glaze is merely a soda-silica-alumina glass coating the surface of the ware. Salt is used for the purpose because of its abundance and cheapness; because it decrepitates; because it fuses and volatilizes at a low kiln temperature (1400 degrees F.); because it does not change chemically in fusion or volatilization.

Water is said to be necessary for the decomposition of the salt and the reaction is given as follows: $2NA+H_2O=2HCI+Na_2O$.

Knett, however, claims that the water reaction is merely secondary and not essential. His theory is that the vaporized salt reacts with the iron or iron oxides and forms the salt glaze and volatile ferric chloride as shown in the following equation: $(Al,Fe,)\ _2O_3,SiO_2+6NaCl=(Al,Na_3)_2O_3,SiO_2+Fe_2Cl_6$

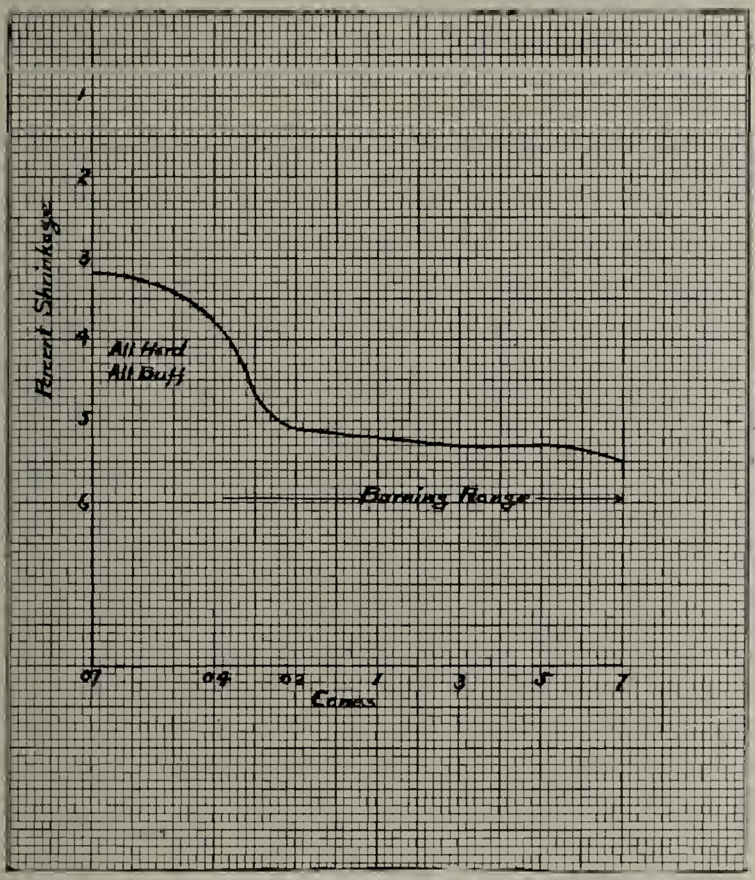


Figure 9.

The latter is decomposed by steam as follows: $Fe_2Cl_6+3H_2O=Fe_2O_3+6HCl$.

His theory requires that the silica be associated with oxides,—preferably iron oxide.

The limits of the ratio of alumina to silica within which a good glaze is possible as determined by Barringer are 1 alumina to 4.6 silica for the minimum and 1 alumina to 12.5 silica for the maximum.

If we allow 15 per cent. for water and alkalies the composition of the minimum ratio will be as follows:

Silica	62.00%
Alumina	23.00%
Alkalies, etc.	15.00%

The composition of the maximum ratio, allowing 12 per cent. for alkalies and water will be:

Silica	77.50%
Alumina	12.50%
Alkalies, etc.	12.00%

It is generally believed that fine grained silica is best for salt glazing but Barrenger's tests show practically no difference in this respect, except that the finer grained silica gives a lighter colored glaze which after all may be due to the fact that it is a better glaze and mantles the dark body color.

The best glaze temperature has not been determined.

It is said that the best glazing temperatures are between cone 3 and cone 8 or higher, but it must be admitted that good sewer pipes are made in kilns which do not at any time attain a temperature of cone 3 and fall considerably below this during the salting, and we have factory records showing average kiln temperature of cone 02. We can unquestionably get good glazes if the temperature is above cone 3 provided the other conditions are right but many of us are interested in knowing how much below cone 3 a good glaze is possible.

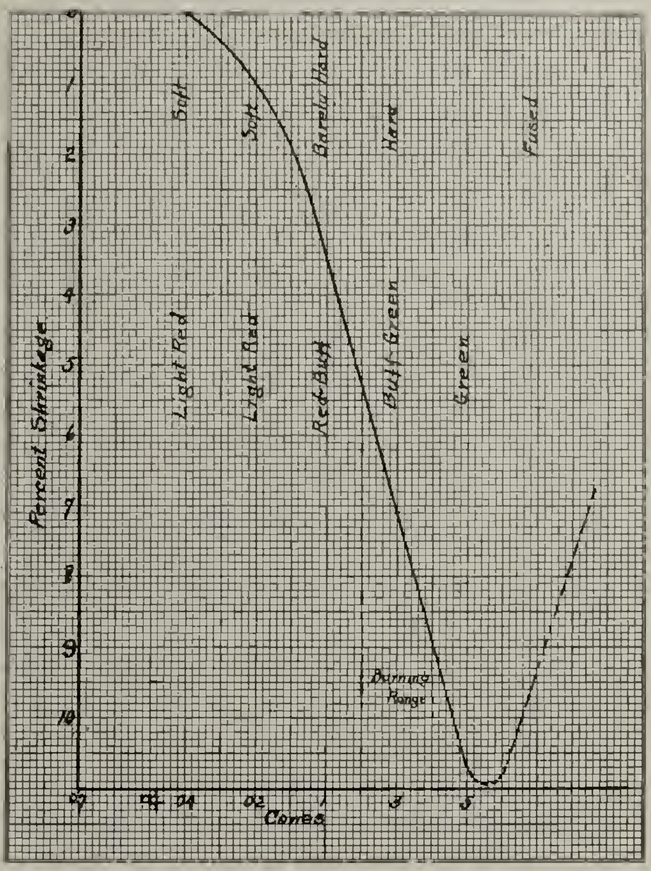


Figure 10.

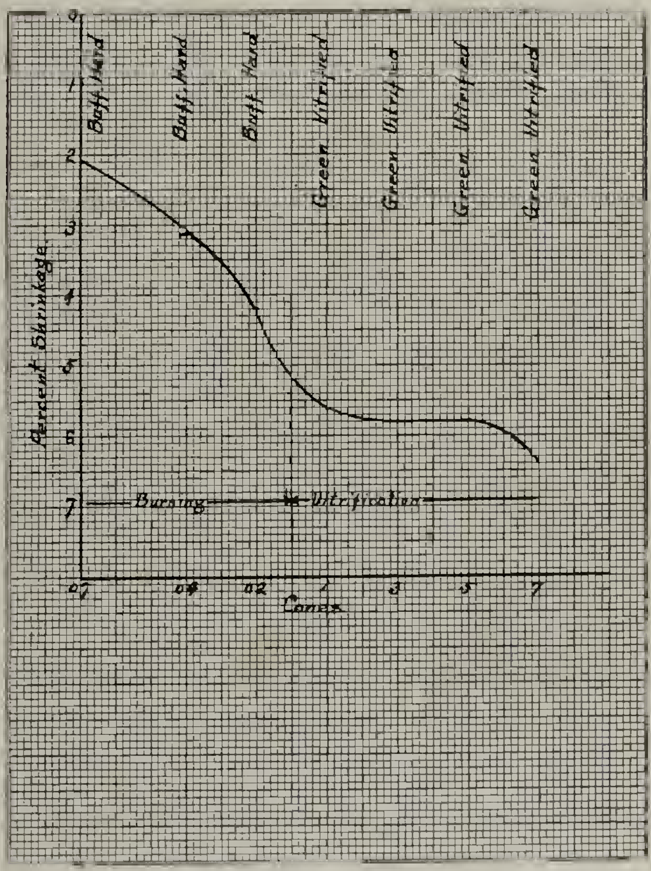


Figure 11.

The quantity of salt varies widely, due probably to bad firing conditions, to a ware which does not take salt readily, and to lack of vitrification at the time of salting.

(To be continued.)

THE CERAMIST'S CORNER

This is a department which appears in The Clay-Worker from time to time dealing with practical and technical matters of especial interest to the ceramist. This month we give a continuation of the paper published by the Bureau of Standards, the first part of which appeared in November.

PROPERTIES OF SOME EUROPEAN PLASTIC FIRE CLAYS.

6. Behavior During Vitrification and Fusion.

The burning behavior of the clays was determined by making up a series of 2-inch cubes of each material and firing them in a large gas-fired test kiln up to the maximum temperature, close to 1400 degrees C., at a rate corresponding to a temperature increase of 20 degrees C. per hour beyond about 1000 degrees C. Care was taken to allow sufficient time for the proper oxidation of the clays. The kiln temperature was measured by means of platinum-platinum-rhodium thermocouples and Siemens-Halske galvanometers. Beginning with 1125 degrees C., a specimen was withdrawn, at intervals of 25 degrees C., from each set, and cooled slowly in a heated pot furnace. The porosity of the cold pieces was then determined by obtaining the weight of the dry pieces, that of the completely saturated, and finally of the saturated piece suspended in water. The absorption of the specimens was obtained by boiling till constant in weight. The porosity was then computed from the relation:

$100\frac{(W-D)}{(W-S)}$, where W=weight of the saturated briquette, D= weight of dry briquette, and S=weight of specimen, suspended in water at room temperature. This porosity value is equivalent to the absorption, in terms of the weight of the dry piece, multiplied by its apparent specific gravity. From the above data the apparent specific gravity was also readily calculated.

In addition, the softening point of each clay was determined in an electric muffle furnace using granulated carbon as a resistor.

The clays under examination were also analyzed as to their ultimate composition.

IV RESULTS OF TESTS.

Editor's Note: Under the above head there appeared parts devoted to the Properties of Clays in the Raw State—Burning Behavior—Chemical Composition—Comparison of Clays and the part which is published below. We are omitting the first from parts of part IV due to lack of space. The reader can secure a copy of this most interesting technologic paper by writing the Bureau of Standards, Washington, D. C.

5...Replacement of Foreign by Domestic Clays.

The question of replacing the plastic clays, imported from Europe in considerable quantities up to the outbreak of the European war, has been of importance to the industries concerned. The materials which are chiefly concerned are the Gross Almerode clay for the glass and the Klingenberg clay for the graphite crucible and allied industries. The physical qualities of these materials have been set forth in detail in the preceding report.

Some of the users of such materials have sought to replace these clays by individual American clays. There is no reason to believe that such clays can not be found in the United States; in fact, materials have been tested in this laboratory which approach the foreign clays in quality. It would be far better, however, to depend upon a mixture of two or more clays, representing both clays of the open and more refractory and of the dense and vitrifying variety to secure the desired condition. Since such clays as those from the St. Louis, Mo., district have been used for years with good success in glass-pot mixtures, in conjunction with the European clays, it would not be difficult to supplement their qualities by means of materials vitrifying at lower temperatures and not subject to overburning within a considerable temperature range. Such clays, it is true, are not common, but may be found among the ball clays or semi-ball clays of Tennessee and Kentucky and in some of the plastic No. 2 fire clays, as those from Pennsylvania and Ohio. It is important to realize that an open burning clay of the Gross Almerode type, whether it be like the plastic clays from Missouri or New Jersey or the silicious clays from Arkansas, should be blended with one or more clays of the opposite type and not with materials of the same class, a mistake which is sometimes made. Likewise, it should be realized that a bond clay suitable for glass work is not necessarily adapted for use in graphite crucibles where greater density of structure at lower temperatures is essential, a fact strikingly illustrated in the difference between the properties of the Gross Almerode and Klingenberg clays. By adjusting the proportions of the two kinds of clay and by thorough mechanical blending through fine grinding, the desired quality can be obtained as well as maintained with results which should be superior to those which have been had with the single imported clays. The claim that no American clays are available which answer the purposes of the industries involved is fallacious, a fact supported by actual foundry results communicated to the writers. Open-burning plastic clays of good refractoriness are found in Alabama, Colorado, Georgia, Arkansas, Illinois (southern part), Kentucky, Missouri, New Jersey, Ohio (southern part), and Tennessee. In the same states, and frequently close to other deposits, dense burning clays are also found, to which must be added materials of this class found in Maryland. There is no lack of materials, and it is a question only of selection.

V. Summary.

Based on the results of the work described in the preceding pages, the writers venture to suggest certain tentative specifications which might be of service in selecting plastic bond clays. The tentative character of these suggestions is emphasized and it is realized that modifications and amplifications will be necessary.

Plastic bond clays should possess a considerable water-shrinkage range, one of about 40 per cent. between the minimum and the maximum water contents, permitting of molding of the clay. In the case of silicious clays, allowance should be made for the content of noplastic constituents and the permissible range reduced to 20 per cent., provided the materials fulfill all other essential requirements. The Atterberg plasticity number should not be lower than 50 nor higher than 110. The ratio of the percentage of the shrinkage to the per cent. of pore water should not be greater than 1:1.2. The total water content, for normal consistency, expressed in terms of the dry weight, should be between 30 and 45 per cent. When intimately mixed with 50 per cent. of potters flint (by weight), the time of complete disintegration in water of a seven-eighth inch cube in the dried state, made of the mixture, should not be less than 50 minutes, the water being at room temperature. The tensile strength of the clay in the plastic state should be close to 4 pounds per square inch.

The linear dry shrinkage should not be less than 6:5 and more than 10 per cent. of the dry length, the drying to be done at room temperature.

When made up with 50 per cent., by weight, of hard burned grog, which passes the 20-mesh sieve and shows residues of 34 per cent. on the 40 mesh, 27 per cent. between 40 and 100 mesh, 12 per cent. between 100 and 150 mesh, and of which 27 per cent. passes through 150 mesh, suitable dried test specimens should show the following minimum strengths: Tensile strength, 150 pounds per square inch; modulus of rupture, 350 pounds per square inch. The drying should be so conducted that the specimens are kept at room temperature until shrinkage has ceased, when they are to be heated to 75 and 110 degrees C, respectively, and to constant weight in each case.

Dried specimens of the clay should be fired in a suitable kiln at a rate, corresponding to a temperature increase of approximately 20 degree C per hour, beginning at 1,000 degrees C and withdrawn from the kiln at intervals of 20 or 25 degrees C. Absorption and porosity determination should be made upon all pieces. The clays should show a porosity of not more than 10 per cent at 1150 degrees C, at 1250 degrees approximately 5 per cent., and should then maintain practically constant porosity up to 1350 degrees in the case of materials intended for graphite crucibles used in brass melting and 1400 degrees for crucibles employed for steel. For glass refractories, minimum porosity need not occur at as low a temperature, nor is it necessary that the clay burn to as dense a structure. In this instance the porosity at 1350 degrees should not be greater than 10 per cent. and should show no increase due to vesicular structure. The linear burning shrinkage may vary, for the unmixed clay, from 5 to 8 per cent., in terms of the dry length, and should not exceed the higher limit. The softening temperature of the plastic clays should not be below that corresponding to cone No. 30 and for glass refractories it would be desirable to have it higher.

The percentage content of total fluxes, Fe_2O_3, CaO, MgO, K_2O, and Na_2O may approach 5 per cent. for crucible clays but should not exceed 4 per cent. for clays used in glass refractories.

The writers desire to express their thanks and appreciation to the Findlay Clay Pot Co., Washington, Pa., for their generous co-operation and assistance.

The authors of this paper were A. V. Bleininger, Ceramic Chemist and H. G. Schurecht, Laboratory Assistant of the Bureau of Standards, Pittsburgh, Pa.

BOOSTING BRICK BUILDING.

While we have been disappointed at times with a lack of enthusiasm and co-operation in connection with the Building Brick Bureau it is evident that the Build With Brick slogan is at work effectively, and that people throughout the country are quietly boosting the brick building game in their home territory. An illustrative instance is reported from Salt Lake City, where it is said that brick manufacturers have developed residence building with brick to a high degree and are reaping the benefit of that Build With Brick campaign. They have reduced it down until they can build with burned clay as cheaply as they can build with lumber and the brick houses sell so much more readily that this form of construction has the preference. There are perhaps other parts of the country where equally effective boosting is being done. We hope so and also wish they would report what they are doing so that we may have the encouragement that comes from a knowledge that the persistent preachments of The Clay-Worker for brick boosting are bearing fruit.

The man who does a lot for his country, puts lots of life and enterprise into it, generally has but little fault to find with it.

BRICK HOMES AT LOW COST.

THOSE WHO ARE planning a home today have little reason to hesitate in a decision between brick and less substantial material. Even the first cost difference has been practically eliminated and the many advantages of the house of brick stand out more prominently than ever before.

Investigation has proven that the average man with from $2,500 to $5,000 to put into a home, may have a substantial, artistic, fire-safe house at exactly the same first cost being paid to speculative builders for poorly-built and badly-arranged fire-traps.

The speculative builder works from two or three stock plans. This means his houses are duplicated over and over again. Whole streets are built up of houses that are identical in every line. The owner knows his own home only by the number on the door or by counting from the nearest corner. He cannot feel any great pride in his own home—when there are forty-nine others exactly like it within sight of his front door.

To impress upon the minds of prospective builders that the brick house need not be large or expensive, but is the logical answer to the question of the best home for the man of moderate means, the face brickmakers of Ohio combined in producing a book of plans, which was distributed in connection with their exhibit at the Complete Building Show in Cleveland during February of 1916.

This book, Brick Homes at Low Cost, contains ten house plans, together with competitive bids upon each from reputable contractors.

In preparing the information for this book, a survey of building operations in a number of cities was made. George W. Ritchie, an architect of extensive experience, particularly in brick construction, was commissioned to produce ten low cost brick houses that might displace, at no greater cost, corresponding types being erected in quantities in both the large and small cities of the Middle West.

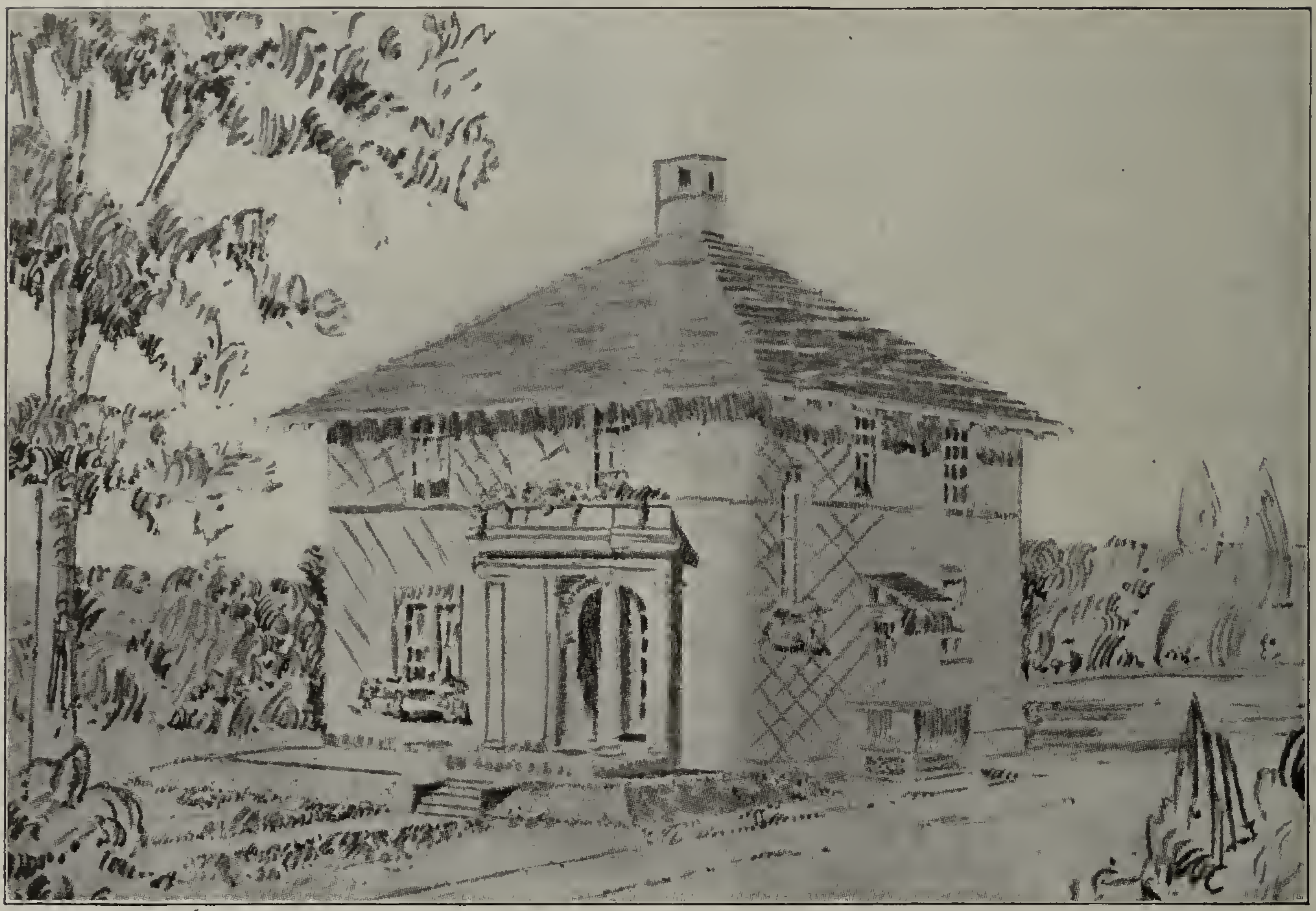
Ritchie visited scores of new houses in Cleveland and nearby cities. They were carefully inspected and measurements taken. Questions were asked as to cost of construction and rental value. The architect then began the task of substituting for these inferior houses, which were inartistic, box-like buildings, ten types in brick that may be completed at the same cost as the houses visited.

Instead of duplicating or reproducing the prevailing real estate or ready-to-occupy houses, Ritchie improved upon every feature. The exteriors were made artistic and distinctive in appearance; interiors better arranged and space economized.

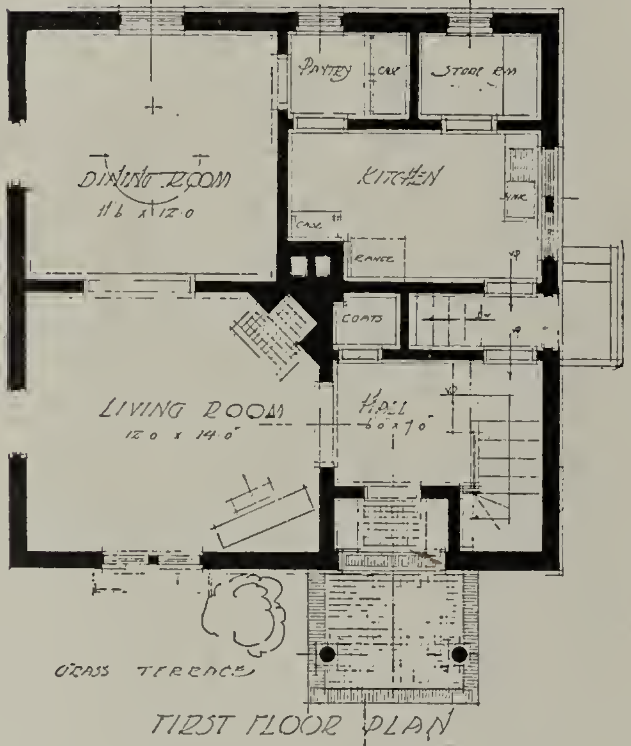
Buyers of the speculative houses are people demanding "easy" terms. To finance building upon the small down payment and monthly installment plan the builder must add an enormous profit to his construction cost. He must cut every corner in the building and use the poorest of materials. The innocent buyer gets the poorest possible construction at a price that should have given him first-class construction. The builder is interested in the house only until his customer takes over the contract. He doesn't care what happens after that. The consequence is the buyer faces rapid depreciation, big repair and painting bills, high fuel bills and uncomfortable winters; and never is able to get his money out of the property if he wants to sell it.

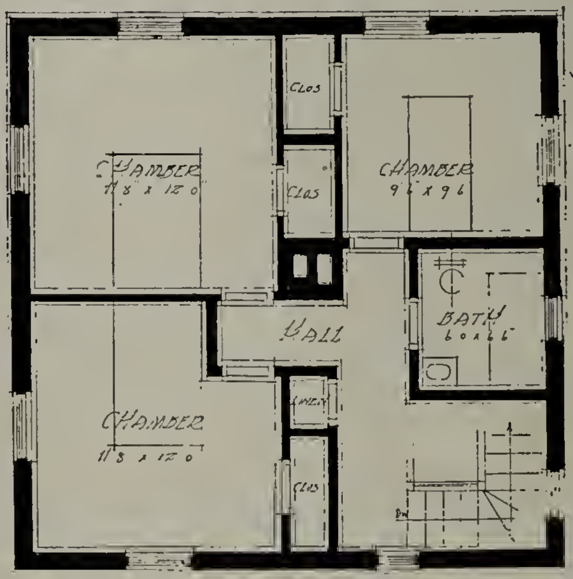
The brick house never grows "old-fashioned" as do houses of freak design. The brick house fits into its surroundings and becomes a part of it. Vines may be trained over its walls never to be torn down for repainting or repairs to the walls, but to grow more beautiful with the passing years.

The brick house does not have to be painted. Repairs are



Plan No. 1.



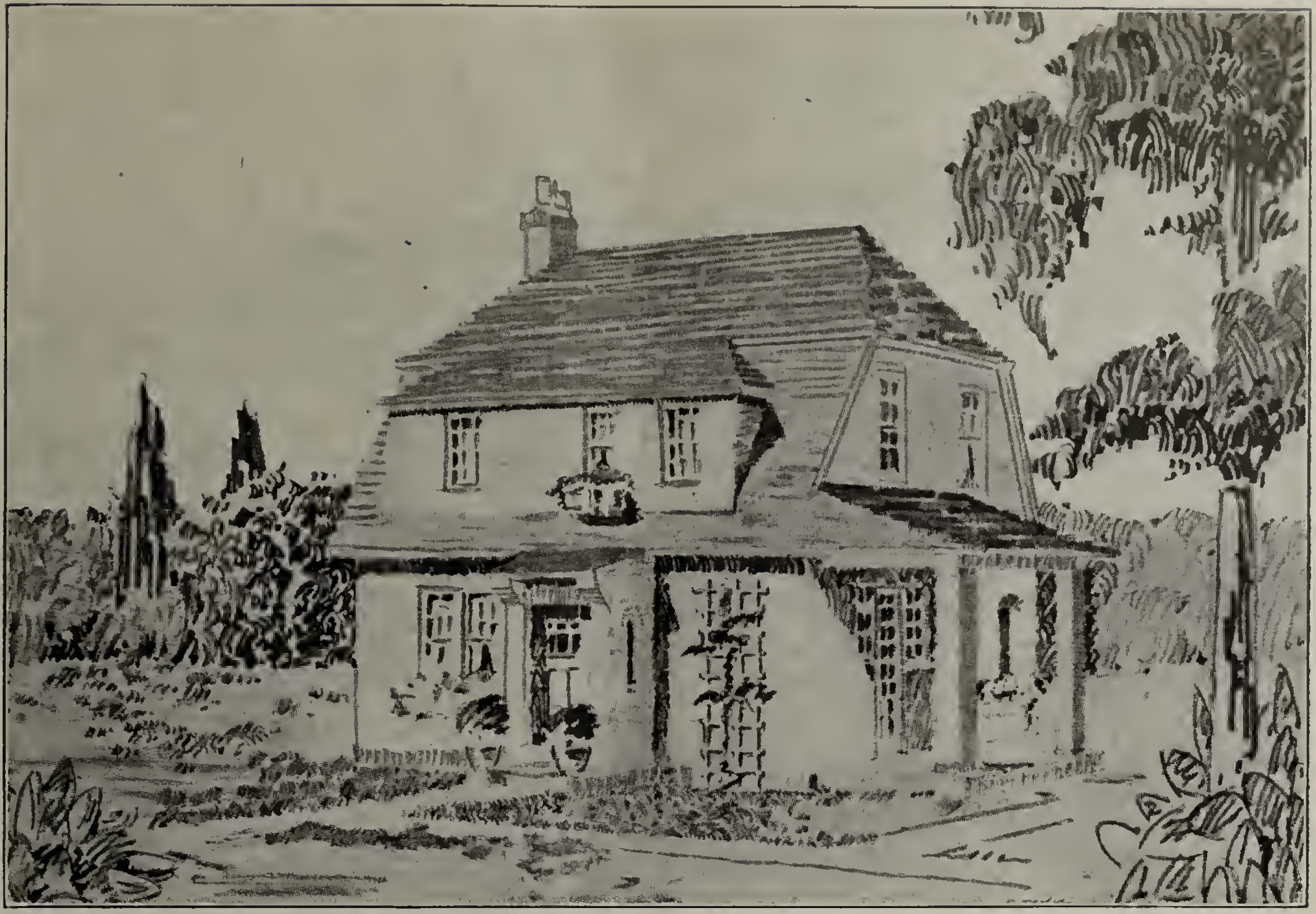


Complete working drawings, elevation and specifications for this house may be secured for $2.00 by applying to the Society Advocating Fire Elimination, Leader-News Building, Cleveland.

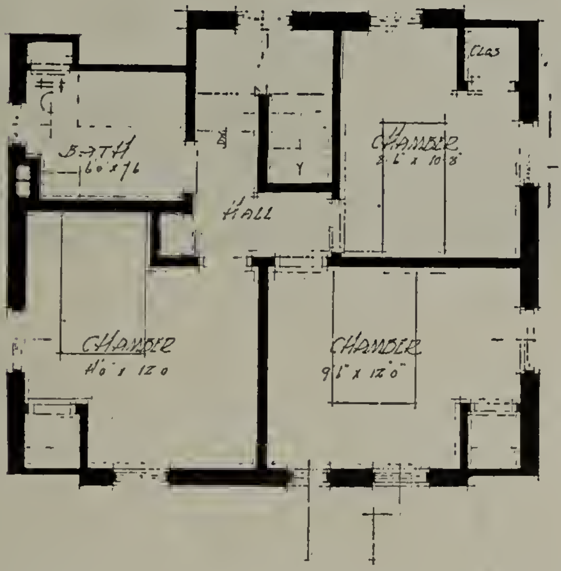
This Plan calls for the use of 11,500 brick. The contractor's price was based at $16.00 per thousand. If type of brick selected varies in cost, merely multiply difference in price by number of brick in building.

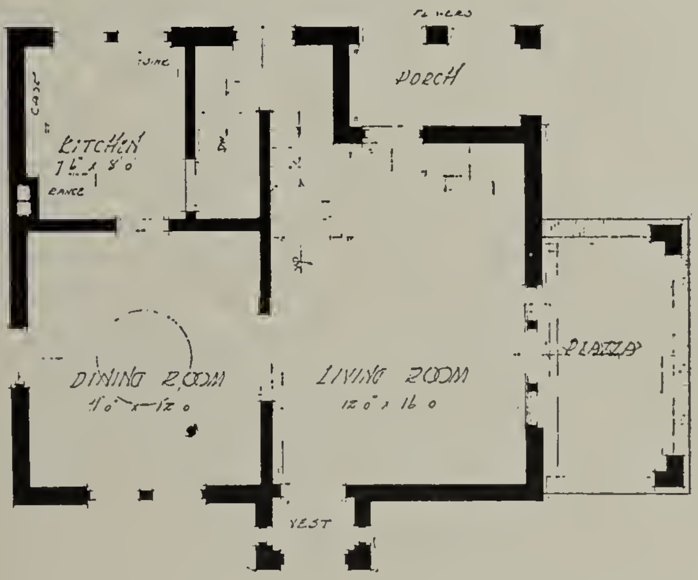
The following bids for the erection of this house, complete, according to typical specifications, were received from reliable contractors. Costs may vary slightly in different localities or with change of market, but these prices will cover costs practically anywhere in the United States.

Contractor "A"	$4,000.00
Contractor "B"	3,860.00
Contractor "C"	3,925.00



Plan No. 2.





Complete working drawings, elevation and specifications for this house may be secured for $2.00 by applying to the Society Advocating Fire Elimination, Leader-News Building, Cleveland.

This Plan calls for the use of 8,000 brick. The contractor's price was based at $16.00 per thousand. If type of brick selected varies in cost, merely multiply difference in price by number of brick in building.

The following bids for the erection of this house, complete, according to typical specifications, were received from reliable contractors. Costs may vary slightly in different localities or with change of market, but these prices will cover costs practically anywhere in the United States.

Contractor "A"	$3,400.00
Contractor "B"	3,510.00
Contractor "C"	3,485.00

unthought of. When it has a roof of inflammable material, as it always should, it becomes safe against fire from the outside and is a wall in the way of a sweeping fire even though surrounded by houses of the burnable kind.

Brick construction permits the owner to realize upon the increased value of his land and this increase is not offset by the depreciation of the house itself. The brick house becomes, then, a good investment for the owner and in addition to providing a safe and comfortable home, summer and winter, is his best savings bank.

That there was a popular and genuine demand for brick house plans has been evidenced by the wide circulation of Brick Homes at Low Cost. Applications have been received by the Ohio face brickmakers from every state in the union. Hundreds of homes have been built from these plans.

In point of dollars and cents, the money spent by those participating in this promotion has been returned to them many times.

The National Building Exposition in New York in March promises to do, on a larger scale, what was done by the Cleveland show. Held in the World's metropolis, with a field to draw from that is almost unlimited, the assurance is unquestioned that the results from educational exhibits will be enormous.

To date competitors of brick are well represented in this show. If the condition of prosperity in the brick trade leads it to "muff" the opportunity of bringing itself nationally before the building public, the makers of materials contesting it for public favor, will be truly grateful.

THE ALL IMPORTANT QUESTION OF COST.

Correct costs? There ain't no such animal. Experience has demonstrated that there is no such thing as a positive cost because of varying conditions and varying degrees of efficiency in management. Still while there is no such thing as positive cost there is such a thing as a uniform figuring basis, and that's the thing we want to get at.

President C. C. Blair, of the National Paving Brick Association, commented upon this matter a little in his annual address at the meeting held at Terre Haute and suggested that a committee be appointed to do some work on the matter.

This is what every association ought to get at and in getting at it it can easily have the active co-operation of the Federal Trade Commission which has connected with it some of the best expert accountants of the country. Moreover, they have issued a pamphlet touching on the subject of the fundamentals of cost accounting for manufacturers that ought to help start the ball rolling.

One of the expert accountants of the Federal Trade Commission in talking of this subject of costs before a convention of manufacturers cited the fact that at one time chaotic conditions reigned in the steel industry and things were so bad generally that a meeting was called. At this meeting the Carnegie people presented a cost sheet plan which was so well worked out that everybody adopted it and from that time till this everybody in the steel industry has used the Carnegie cost sheet, consequently, everybody figures uniformly in cost accounting.

This is what we need in the clay-working industry, a standard uniform method of figuring, not only a common method, but a common basis of accounting for certain items of cost, for it will take something of this kind to put the trade on a common and understandable basis for figuring prices. The man who can develop enough efficiency to get by at a lower cost than the standard will be entitled to that extra money anyway, and undoubtedly once we get the right kind of standard or uniform method for cost accounting we will be in a position to more uniformly get fair prices for brick. That is the point we are after, to get better prices and make fair profits. And it is argued that the best road to this end is through uniformity in cost accounting.

OLDEST REAL CLAY BUILDING.

THAT BURNED BRICK, made from common red clay, are capable of successfully resisting, for many years, the wear and tear of the elements, is clearly demonstrated in the case of a little old building that stands on a prominent street in the city of Monterey, Cal. Monterey is one of the very oldest towns in the state, and was known best as the "Old Spanish Town."

The building referred to was built about 1842, and enjoys the distinction of being the first real brick building constructed in California. This is no adobe building, but is built of common red clay brick, well burned.

The work was supervised by an American, but the actual brickmaking was done principally by Mexican laborers. Sixty years ago Monterey was only a little straggling Spanish hamlet, and all the buildings consisted of 'dobe huts. These real brick were made at a spot where a bed of red clay was discovered some little distance from the village.

The mixing of the clay was done by hand, rude mining shovels and wooden paddles being used. The clay molds were cumbersome, crudely constructed wooden boxes. However, the brick were not slighted in the burning process, but were very thoroughly burned, pine wood being used for fuel. In all, about 25,000 brick were made.

The Oldest Brick Building, Monterey, Cal.

After being burned, the brick were hauled into the little town, a distance of nearly two miles, on rude clumsy, two-wheeled Mexican caretas, drawn by bulls. Considerable time was required to haul all these brick. Later, the small foundation was laid, and the little building was slowly erected. One man—an American—did all of the masonry work. The lime used in the mortar was also burned near Monterey.

This first real brick house in the state has stood for about three score and six years. In that time it has been used for a great many purposes, including a dwelling house. During that time the old structure has been repaired and overhauled many times—painted outside, and whitewashed inside. For several years past, the building has been tenantless.

Still, this old "relic of bygone days" remains in a very good state of preservation—the brick and mortar retaining, to a remarkable degree, their structural integrity. The old building demonstrates the time-resisting quality of common burned clay brick, even if crudely made.

The illustration shows this old brick house just as it appears today.

THE PRICE OF MEN.

A good man is cheap at a big price; a poor man is dear at any price.—Southwestern Journal of Commerce.

CLAYWORKING IN EUROPE IN WAR TIME

Vicissitudes of the Brick Industry in England As Seen by Alfred Crossley, An Old Time Correspondent of the Clay=Worker

By Alfred Crossley

A LITTLE OVER TWO years ago the above title would have sounded somewhat fantastic and the prosaic clayworker scribe would have been accused of indulging in flights into fiction. Alas, it is now the dread terrible truth. It would be idle to say that brickmakers in America don't know there is a war on, for the horrible fact is in the mind of men the world over, but it has made probably little or no difference to the craft as far as trade is concerned. But such is not the case in Europe. What things are like with our fellow clayworkers in Belgium and France we may perhaps only imagine. In England the situation is chaotic. Within three months of the beginning of the war the building trade was in a state of collapse and was soon practically dead. Existing contracts were with a struggle carried to completion. Public works schemes, except those of a most urgent nature, were pigeonholed and private building enterprise soon ceased. The brickmakers struggled on for a while, until their stocks piled up and then, with a few exceptions, one after another either shut down altogether or reduced operations to the smallest possible working scale. This, of course, was largely for want of orders, but in many cases also for the want of men. For, to their credit be it said, few trades have furnished so large a proportion of volunteers to the army as have the clayworking trade. In one case that I know of the owner of a yard was left with three men only. He had a certain amount of trade, so the four of them would go down into the clay pit and fill all the tubs, then draw them to the top with a pony, start the engine, one feed the machine with clay and the other three tend the machine and wheel away the bricks and set them. When the clay was made up stop the engine and repeat the operations. Brickmaking under difficulties sure enough.

Demand for Brick for Munition Factories.

After the first shock of paralysis, and brickmaking had become practically a thing of the past, a new source of demand arose, from the building of munition factories and other Government work all over the industrial sections of the country and existing stocks of bricks began to be used up very fast, so that now in certain localities there is actually a scarcity. But as most of the yards are shut down and no men can be got to re-start them, in many cases bricks are being transported long distances. No private building contracts, except of a small character, are allowed to be undertaken without the express sanction of the Government and even for these small jobs in some places high prices have to be paid for bricks. All this, of course, applies solely to ordinary common and pressed bricks.

Fire Brick Trade Increases.

Fire brick and especially silica brickmakers have from the beginning of the war had an enormous demand for steel and iron works, which are all under Government control and working at highest pressure. The demand for all classes of refractory bricks therefore has been increased enormously and prices have been doubled and trebled. The capacity of existing works has been increased to the last notch, and in some cases red brick works that were standing idle have been converted into fire brick or silica brick works.

The sewer pipe makers have been having a bad time, at least the majority of them. As there is no building going on, there is no house draining work and all public sewerage schemes are held up, besides which the export trade to Europe, which was very considerable, is completely stopped. Those works using fire clay as their raw material have been able to turn their places into fire brick works for the time being and are doing well. A few others, whose material is stoneware, capable of resisting nitric and other acids, have been able to get plenty of orders from government factories and other works making high explosives. The works of which the writer is the head is fortunate to be one of these. All other sewer pipe works are either shut down or running on a very much reduced output. War times, however, are not peace times and the clayworking industries of the whole country have had to be adjusted to the strange and unwonted conditions under which we, for the time being, live and work. What the future has for us we know not.

After the War—What?

The war will end sooner or later and then there will have to be a fresh adjustment in all lines of trade. The demand for munitions, of course, will abruptly cease and the fire brickmakers will be at once effected, but a great many more silica and magnesite bricks will continue to be made in this country than ever before and less imported from Germany and Austria. The same will be true in even greater measure of the chemical industry, for which in time past we have so largely depended on enemy countries. This will not be the case in future and hence those works making chemical stoneware may still expect to be kept fairly employed. It seems certain also that the building trade will be good for some considerable time, despite the high interest that will have to be paid for capital. Owing to causes that are well understood here, housebuilding had fallen off very largely for a few years past, so much so that the scarcity of houses was beginning to be acutely felt. The complete suspension during the war has accentuated this, so that house building will have to be resumed as soon as ever conditions permit. The people must have houses and although it is well recognized that they will not be built for many years, if ever again, at the prices they have been, yet we cannot do without them. Beside this there are many building schemes of a public character, already planned when the war broke out, that will have to be taken up again and carried out. And so the ordinary building brickmakers ought to have a good outlook in front of them.

SEATTLE'S GROWTH.

We are indebted to the Denny-Renton Coal and Clay Company of Seattle, for the Christmas number of The Argus, one of the most beautifully illustrated magazines that has ever come to the Editor's desk. It is really a work of art, and depicts in a graphic way the wonderful growth of Seattle in the past decade, and shows many of the picturesque views for which that district is noted. Naturally beautiful Mount Rainier is a conspicuous figure in many of the illustrations. To those who have visited that wonder land, the views will be a very pleasant reminder of the delightful vistas of the mountains and valleys, that for natural beauty are not surpassed anywhere on the globe. To those who have not had the pleasure of a sight seeing trip there, they will justify in the fullest the force of the slogan, "See America First." The lover of grandeur in nature needs not cross the ocean to gratify his heart's desire in that respect. The issue also demonstrates the achievements of Seattle as a great commercial center, a city of progress, young in years, but pregnant with tremendous possibilities. This special issue is offered by the publisher, H. A. Chadwick, at 35 cents. Address The Argus, 4126 Arcade Bldg., Seattle, Wash.

Build With Brick!

❡"Why should we build with BRICK?" Because BRICK is the one material which satisfies all the demands of the modern builder—endurance, safety, comfort, health, beauty and economy.

❡"Of the materials offered for building, which is the most permanent?" The editor of the Youth's Companion, in the issue of November 9th, on the Family Page, says:

❡"The best of the man-made materials is BRICK. It has passed the test of time, it recommends itself to the eye in color, texture and in size, which is small enough to permit the use of pleasant patterns, called "bonds," and of varying sizes in window and door openings—both impossible with the cement and terra-cotta blocks now on the market. It has a further advantage in being solid, so that it can be used in piers and all members that require strength. In some neighborhoods the cost over wood construction is ten per cent, but the saving on maintenance outweighs that."

❡The Minneapolis, Minnesota, Journal says: "In the City of Minneapolis one can now see ten attractive homes built of BRICK where fifteen years ago he saw but one."

❡Detroit this year is using upward of 450,000,000 BRICK in construction work, says the "Free Press."

❡Those who have studied the subject carefully say that BRICK is more desirable from a practical standpoint than other forms of construction, because it is durable and sanitary and not combustible. It lessens considerably the insurance rate; it makes the home comparatively cool in summer and warm in winter, thus reducing the heating bills, and it announces to the world that you are a home builder, are building for permanence.

❡And since many more people see the outside of your home than the inside of it, these outer walls tell their story of permanence to a greater number of people, to the casual passer-by as well as the visiting friends. It has enough variety in color that any artistic idea can be readily carried out; the color is lasting, and the walls require no periodical painting to keep them in order and attractive, which is a matter of economy in final costs as well as satisfactory all the time.

❡One of the interesting characteristics of the architecture of today is in the widespread use of BRICK for porches and BRICK piers in lieu of wooden columns. The BRICK porch is an improvement architecturally over the old frame porch. It gives permanence and beauty and an air of stability that appeals to the eye and to the sense of permanence.

❡Prophets of the architectural world have predicted that the American archicture, when it is finally evolved, will be one of BRICK.

❡The modern methods of mixing clay and burning BRICK make them more durable than those which have gone before, although in Eastern countries bricks laid in the dawn of history are intact today.

❡High Class Face BRICK are now made in Evansville and it is no longer necessary to pay the freight on long distance transportation, a saving of from three to eight dollars per thousand.

"Investigate BRICK Before You Build"

Kessler & Riebenthaler
CONTRACTORS
Room 9, Furniture Bldg.
Telephone 3725

Krist. Kanzler & Son
CONTRACTORS
712-713 Old State Bank Blg
Telephone 3471

Scarborough-Davies Co.
CONTRACTORS
710 Old State Bank Bldg.
Telephone 352

M. J. Hoffman Cons. Co.
CONTRACTORS
322 Sycamore St.
Telephone 836

Koch & Griesbacher
CONTRACTORS
327 Sycamore St.
Telephone 2368-1

Standard Brick Mfg. Co.
Manufacturers of
High Class Face Brick
8 Furniture Bldg.

Anderson & Yeatch
CONTRACTORS
511 Upper Eighth St.
Telephone 867

Replica of Page Ad which appeared in the Evansville Courier Sunday, January 7th.

COPERATION IN ADVERTISING

AN EFFECTIVE WAY TO BOOST BUILDING BRICK

CO-OPERATION of the right kind is a great thing anywhere, any time. We are impressed anew with this fact every once in a while by some incident or other, and right now it is a case of co-operation in advertising brick. This time, too, it is local co-operation of a somewhat different nature from that which ordinarily comes to mind when the subject is up for attention.

In this case the co-operation was between brick manufacturers and brick contractors. That is what gives it particular interest and makes it a sort of new feature. We have talked about and had a fair share of co-operation between brick manufacturers in a given locality for boosting the Build With Brick idea, and now there is room for a lot of good work along the line of co-operative advertising, that is co-operation between the brick manufacturers and the men who put the brick into buildings or take contracts to do it. The boosting of brick as a building material helps make better business and a bigger future for the contractors in the brick business as well as for the brick manufacturers, consequently they should be interested in and contribute to some of the efforts put forth by brick manufacturers in boosting brick.

Our Evansville friends of the Standard Brick Manufacturing Company, who are always pulling off something new and interesting in the way of local advertising, have lately furnished a splendid example of this kind of co-operation in boosting brick.

They took a full page spread in the anniversary number of the Evansville Courier, and it will be seen by the replica of the ad. on the opposite page. The advertisement was headed by a prominent display line of our famous Build With Brick slogan. There followed some interesting reasons why, well set forth, and then at the bottom appeared the names of six brick contractors of Evansville along with the name of the Standard Brick Manufacturing Company, each firm being enclosed in a small box, uniform as to size.

It was easily evident that the brick contractors were benefiting from this ad., which had evidently originated with the brick manufacturing folks, and while approving the idea of this kind of co-operative advertising, the question naturally arose of how, and on what basis.

Inquiry develops the fact that in this case the basis of the division of cost is substantially 5 to 1, the brick manufacturers paying $5 to $1 of each of the group of brick contractors.

This is an inspiring example of co-operation between brick manufacturers and brick contractors in boosting the brick game, one that may well be followed by others, not only in the building brick business, but even in the paving brick line.

THE BEST MAN-MADE MATERIAL.

THAT well-known and long respected family publication the Youth's Companion, has in its family department been devoting considerable attention to the house problem. On the subject of building and building costs the editor in charge of this department has said:

"The cost of building has risen steadily, by reason of increased wages. Those who warn you not to build now, but to wait, have the vaguest possible expectation of lower prices. If prices are lower, it will be because of conditions that

The High Cost of Living

An embargo? A boycott? NO! Efficiency and production? YES!

The U. S. now has a population of 103,000,000, most of whom are moving and living at high speed.

This is a three story age, submarine, surface and aeroplane.

Mr. Farmer, EFFICIENCY has always been as essential to you as to the banker or manufacturer. Today it is more essential.

SUBMARINE YOUR LAND WITH TILE, REMOVE THE WATER, let the AIR in and warm up the SURFACE and produce BIG CROPS, of best quality and receive AEROPLANE PRICES.

TILE **RIGGS CLAY PRODUCT CO.** SMILE

Ask Yourself These Questions:

How can I get cheapest Insurance, and greatest safety from fire?
How can paint bills be eliminated?
How can I get the coolest house in Summer and the warmest in Winter?
How can I reduce repair bills to a minimum?
How can I get greatest returns on my investment?
All these questions have one answer:

BUILD WITH BRICK

There are some few types of construction that can be used a little cheaper first cost than brick, but they will not solve any of the above questions, and consider what you would sacrifice for the future.
It will pay you to investigate.

GEORGIA-CAROLINA BRICK COMPANY
Howard H. Stafford, Prest.
418 Jackson Street. Augusta, Ga.

make money scarce, and so nothing will be gained by postponement, for the time to build is not necessarily when building is the cheapest, but when you are the richest.

There are two things to be considered under the head of cost—first cost, and maintenance. First cost is the item that betrays us into most of our mistakes. It lures the unsuspecting into economies that later on undo him.

Painted wood is beautiful and cheap, but paint must be renewed every two or three years, and that is a big drain on the pocketbook. Wood shingles, unstained or stained, are cheap both for walls and for roof, and the item of repairs is postponed for many years, but when it comes it is large. Meanwhile the fire menace is serious, for a shingle roof is difficult to protect against fire. It means higher insurance and less safety. Stucco is not safe in a northern climate. It may last five years, or ten, or even twenty, but a permanent porous surface of thin friable material can not be had where temperatures vary from 100 degrees Fahrenheit to many degrees below zero.

Concrete is used with apparent success, but it is, of course, risky. It is mixed on the spot by Tom, Dick and Harry, and upon the mixing depends its quality. Once it is set, you find it almost impossible to remove any faulty portion, or to alter the house. Concrete blocks have some advantages over solid concrete. The material is sure to be well mixed, and it lays up easily and can be removed or altered. It has the drawback of not having been tested by long periods of time, and it is not beautiful either in color or in texture. Terra cotta blocks, like concrete blocks, await the test of time and the verdict of the eye, but they have the advantage of variety of color and texture, and of a much more cheerful tone.

The best of the man-made materials is brick. It has passed the test of time, it recommends itself to the eye in color, texture and in size, which is small enough to permit the use of pleasant patterns, called "bonds," and of varying sizes in window and door openings—both impossible with the cement and terra-cotta blocks now on the market. It has a further advantage in being solid, so that it can be used in piers and all members that require strength. In some neighborhoods the cost over wood construction is ten per cent., but the saving on maintenance outweighs that."

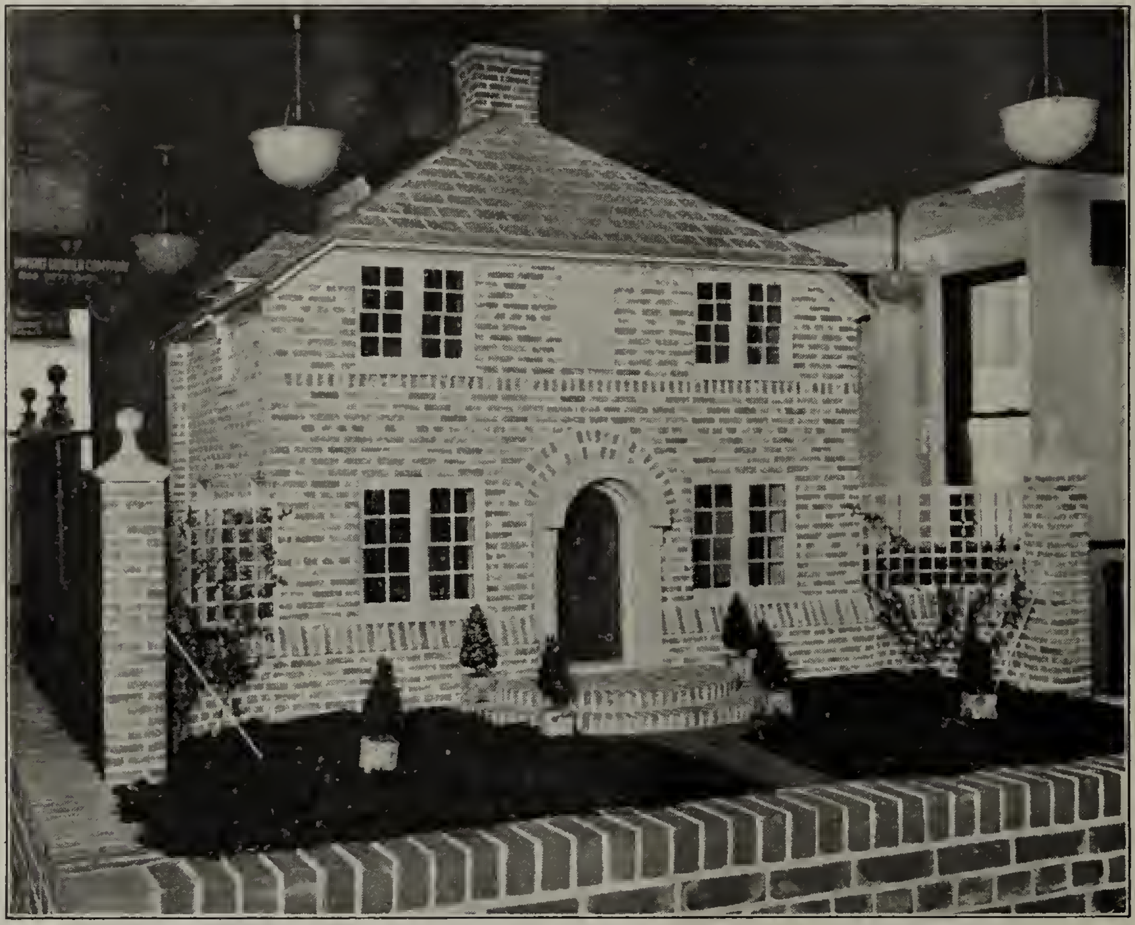
BOOSTING BRICK THE DETROIT WAY

WHAT IS PROBABLY the only exhibit of its kind in the country has been completed by the Detroit Brick Manufacturers' and Dealers' Association. The display, the purpose of which is to advertise common brick, is a miniature brick house, complete in every detail, erected in the exhibit rooms of the Builders and Traders Exchange of Detroit. The exchange recently leased the entire fourth floor of the new Penobscot Building for its headquarters and exhibit rooms, where is displayed everything that goes in the making of a home or factory, and the brick house is the center of attraction.

The house is six feet square and two stories in height, constructed entirely by hand-molded miniature brick made from Detroit clay, the same as that which is used in the manufacture of Detroit's famous red brick. The miniatures are 3½x1¾x1 inches. The construction of the house was under the supervision of Stokes and Whittingham from plans prepared by Wm. B. Stratton, architect.

The house is complete in every detail. There is a living room, dining room, sun porch and kitchen on the first floor, with four bedrooms and a bathroom on the second floor. It is lighted with electricity, has hardwood floors throughout and is completely furnished. The roof is of slate, cut in proportion to the miniature brick. Surrounding the house is a lawn, with gravel walks and shade trees. The house stands on a platform or wall, 2½ feet in height, constructed of Detroit made common brick, set up in English bond with white mortar joints, the same as the house, the wall being the only common brick exhibited.

Two days each week, various classes of children from the public schools of Detroit, are invited to visit the exchange exhibit headquarters and prizes are awarded for the best essays written about the exhibits by the pupils of the different grades. Oddly enough, not a single essay has yet been written that does not mention the miniature brick house, which speaks volumes for the attractiveness of the miniature residence. Detroit architects visit the exhibit rooms daily with their clients for them to make their selection on materials and equipment.



Permanent Exhibit in Builders' and Traders' Exchange, Detroit, Erected and Maintained by the Detroit Brick Manufacturers' and Dealers' Association

A Miniature House made of Miniature Brick Perfect in Every Detail, which Attracts the Attention of Many Prospective Builders

AMONG PHILADELPHIA BRICKYARDS.

ALTHOUGH January is recognized as not being a much sought after or cared for month with the brick manufacturing and similar industries of Philadelphia and adjacent sections of the country, it must be said in the defense of January, 1917, that business conditions on the whole with local members of the industry are far more desirable at the present time than has usually been the case at this time for quite a number of past years.

With the building material market of this city now in the midst of its customarily inactive winter season, business with the local building brick, terra cotta and tile manufacturers is generally reported as being "seasonably good," which report indicates well for the new year. In many instances such manufacturers in this section have taken advantage of the fairly open winter conditions to clean up as much as possible of the hang-over business of last year so as to allow them a clear slate with which to begin operations afresh next spring on an anticipated strong demand for clay building materials. Thus it happens that more than usual brick plant activity is noted in this section at this writing.

From time to time during the past twelve months reports have been received and published from practically all the local clay product manufacturers. In the greatest percentage these reports told of good business conditions and an active demand for brick, terra cotta and building tile, the other percentage or that which did not lead one to believe that 1916 was sure to prove a banner one with the Philadelphia and adjacent manufacturers were those emanating from the paving brick branch of the industry for which the past year was not quite as good as is to be desired.

That such optimisticly featured reports were founded upon true facts is now substantiated beyond any possible doubt by the figures comprising the report for the past year as issued on January 2 by the Bureau of Building Inspection of Philadelphia. This report, which is the work of Chief Statistician William S. Gamble, of the Bureau, shows that building operations for the year 1916 in Philadelphia totalled nearly $50-000,000. This is not only a gain of some $10,000,000 for the past year over the total made by 1915 but is as well the biggest building outlay registered by a single year since the establishment of the Philadelphia Bureau of Building Inspection.

Building construction work in this city during the past twelve months covered a wide range from the traditional Philadelphia two-story brick dwelling to the huge brick apartment house, and from the factory to the bank building. The total money spent in building work in this city during 1916 covers 8,838 permits issued for 15,613 building operations, involving a total building cost of exactly $49,896,570. During 1915 a total of $39,444,125 was spent on building operations here. The nearest approach to the record-breaking total made by 1916 was that of the boom year of 1909, during which period $42,881,370 represented the cost of 17,294 new structures.

"Business with the brick industry of Philadelphia," said John F. Brady, head of the Independent Brick Company, 1002 Crozier Building, "is opening up right for the new year. We have already booked considerably new business and think the time between now and the resuming of building activities for the spring and summer will be an active one for building brick manufacturers and distributors." Among orders recently awarded to Mr. Brady are those calling for 1,500,000 red brick for a dwelling operation in Germantown; for 1,-000,000 brick for J. Bechtel & Co.; for 1,000,000 brick for W. W. Linsley & Co.; for 1,000,000 face and hard brick for the Sun Ship Building Co.; for 500,000 shale brick from Firestone & Middleton; for 300,000 brick of the Queen River fire type; for 500,000 brick for Roydhouse, Arey Company, and quite a number of lesser contracts.

Speaking of existing conditions of vitrified brick interests of this section John C. McAvoy, of the McAvoy Vitrified Brick Company, Philadelphia, reports: "Little change has been occasioned in the paving brick market of this section by the advent of 1917. As has been the case for the past few months, the demand for vitrified pavers is very quiet. Of course we realize that this is the usually dull time of the year for paving brick, but at present it is quieter than ordinarily. However, the future holds forth wonderful prospects for the Philadelphia manufacturer of paving brick and we confidently believe the current year will represent a big improvement over 1916. The demand for sewer brick continues active and, in fact, is running ahead of the production."

In a report of conditions received from R. T. Hutchins, general sales manager for the Mack Manufacturing Company, Philadelphia when asked concerning their business said: "We have several large contracts on hand and new business is opening up very well. Our plants have been operating to capacity all of last year and thus far this year, which is more or less an unusual occurrence. The outlook for 1917 is very bright."

A. S. Reid & Co., Inc., with offices in the Morris Building, Philadelphia, report having transacted a banner year's business during the past twelve months. Among contracts which have been awarded to the company are those calling for 400-000 face brick for the Mercy Hospital, Philadelphia; 250,000 face brick for loft building, Ninth and Sansom streets; 275,-000 face brick for garage for Penna. Taximeter Company; 220,000 face brick for Dupont office, Wilmington, Del.; also seven other large orders for face brick aggregating 1,952,000. The Reid Company also was awarded the contract for 225,000 enameled brick for State Hospital at Spring City, Pa., and other enameled brick orders aggregating 250,000, in addition to contracts for 2,550 tons of hollow tile fireproofing materials. This firm is among the numerous other local brick enterprises which hold forth the belief that the current year will be another excellent one for the brick industry of this section.

A. QUAKER.

TRADE NOTES.

The John C. Boss Company, of Elkhart, Ind., writes that prospects for 1917 are decidedly good in their line.

Phillips & McLaren, Pittsburg, Pa., manufacturers of dry pans, clay crushers, etc., write that the past season has been a very busy one with them and that every indication points to a still better trade during the coming months. Clayworkers desiring heavy service crushers, or any line of castings and repairs, are requested to write them for catalogue.

Our readers will find an unusual ad on page 82 of this issue, that of Charles Engelhard, of New York City, who offers the trade an improved form of pyrometer, which will appeal to brickmakers because of its simplicity. It has other merits, of which Mr. Engelhard will be glad to tell our readers on receipt of inquiry. His office is in the Hudson Terminal Building, New York, where the latch string will hang out convention week.

This is the season of the year when brickmakers ought to be overhauling their plants and putting them in the best possible shape for the coming season, which bids fair to be an unusually busy one. Kilns should be examined and prepared. In doing this work they may need kiln bands and other supplies. The Hook Patent Kiln Company offer something special along this line, as the reader will see by turning to page 84 of this issue.

The History of the Ceramic Arts.

By Charles F. Binns.

Continuation of An Address Delivered on the Occasion of the Dedication of the Ceramic Building of the University of Illinois, by the Nestor of Ceramic Art in America.

THE CITY OF COLOGNE was famous for the production of salt-glazed stoneware and varieties originated in several other places. In those days articles which were exported commonly took the name of the place of shipment, hence this ware was known as Gres de Flandres or Gres Flamande. A familiar type is the Graybeard, Bartmann or Bellarmine. This is a corpulent jug with a bearded mask for the spout. The last mentioned name was given by some wag who saw in the bearded face a likeness to the notorious Cardinal Bellamine. Thus do the deeds of men live after them.

We will now resume the story of enameled pottery and follow its fortunes into France. At the time of which we are speaking, the opening of the seventeenth century, the countries of Western Europe were divided into more or less independent dukedoms or electorates. The rulers of these provinces encouraged local arts and many of them fostered the production of pottery. Thus the Duc de Nivernais, brought to Nevers an experienced worker in enameled wares. This man came from Faenza in Italy and from this fact arose the name "faience" as the French equivalent of Majolica.

In 1644 the art was brought to the ancient Norman city of Rouen. Here great developments took place and the city became an important center of faience manufacture. The industry received a great impetus in 1702 from the depletion of the treasury of King Louis XIV by war and famine. At that time the Duchesse of Orleans, sister-in-law to the King, wrote, "The King is so determined to go on with the war that he has, yesterday, substituted faience for his gold plate; he has sent all the objects in gold he possessed to the mint to be coined into louis."

The example of the King was followed by the nobles and we read that "all the great and illustrious personages were in a week provided with faience. They ransacked the shops and developed a frantic enthusiasm for that ware."

The potters were not slow to take advantage of the demand and splendid services were produced. The manufacture was carried on in many other centers such as Moustiers, Strasburg, Marseilles and Dijon but it is not possible to review these in detail. The story of pottery in France includes two enterprises which, like Melchisideck, had neither beginning of days nor end of life, that is they had pride neither of parenthood nor posterity. The earlier of these, was the faience d'Oiron generally known as Henri Deux ware. At the chateau d'Orion near Thouars there resided in 1524 one Helene de Hangest, widow of a former Grand Master of France. This lady was an artist of skill and in some way she contrived, with the assistance of two men named, Bernart Corpentier, to design, make, decorate, glaze and fire a number of pieces of the most exquisite pottery.

The pieces were constructed of a cream colored clay and in form they partook almost of an architectural character. The principal feature, however, lay in the decoration. This consisted of an intricate series of interlacing lines and bands which were sunk in the light colored clay and then filled in with dark clay. The whole was covered with a transparent colorless glaze. The style and the method are unique and it has been thought that the idea was based upon the tooling of book covers. This theory has acquired weight from the fact that Bernart was the keeper of the library at the chateau. Only fifty-seven pieces of this ware now exist. One is in a private collection in Russia and those remaining are equally divided between the National Museums of France and England.

The second enterprise of special character was that of Bernard Palissy. It was in 1542 that he wrote, "It is now more than five and twenty years that a cup was shown to me of fashioned and enameled clay and of such beauty that from that day I began to struggle with my own thoughts and heedless of my having no knowledge of the different kinds of argllaceous earth I tried to discover the art of making enamel, like a man groping in the dark."

A good deal of speculation has been indulged in as to the reason for the peculiar attitude which Palissy assumed. The art of enameling was no new thing. He himself had practiced glass painting and must have known something of fire and vitrifiable colors. We have his own statement that there was near his home a pottery to which he at first sent his trials to be burned. What then was his idea and what his aim? Mr. Solon has offered what seems to be the most probable solution of the problem and his suggestion is that the cup which was the source of Palissy's inspiration was actually a piece of Chinese porcelain. Now if you will try to recreate the situation in your own minds you will see the reasonableness of the theory. Palissy was familiar with the enameled ware of Italy but had seen no other pottery with a white, glazed surface, therefore, when the porcelain cup made its appearance it must have seemed as did the Holy Grail to Galahad, and he had no alternative but to pursue it. If this be the solution it is no wonder Palissy failed for what he attempted was as if to create a gentlewoman by changing her gown.

Nevertheless, it is to this fruitless endeavor that we owe the beautiful wares which Palissy made. Though he never succeeded in making the white enamel of his ideal he did succeed in producing pottery of a surpassing fine quality such as had not appeared up to that time and has not been excelled to this day. His most important works were modeled in a crude clay, largely in imitation of natural objects and the forms were covered with glazes of clear pellucid colors as of pebbles seen at the bottom of a brook.

The progress of pottery in England must always be of interest to Americans because both knowledge and practice here has been derived from what is affectionately called the old country. The early British had some knowledge of clay-working and examples of their funeral urns are to be seen in all museums. The Romans improved the art but with the Saxon conquest most of this was swept away.

About the fourteenth century the first signs of a revival may be noted. Some years ago there were found at the bottom of a well at Chichester two jugs which have been assigned to this date. In imagination one can see the country girls going to fetch water, each, like Rebekah, with her pitcher. They gossiped as girls evidently did even then and the pitchers were lost in the depths of the well.

From the fourteenth to the seventeenth century pottery was little more than a craft of the peasantry. By degrees small communities of potters were formed in locations where suitable clay was to be found. In this way the potteries of Staffordshire came into being. Clays of rather crude quality were, and are, abundant in the Northern part of the country. The fuel at first was wood but the locality also contains an abundant supply of fine coal which is exclusively used now.

During the seventeenth century the style of work known as slip decorated ware was very popular. The process dates back to Roman times but it had long fallen into disuse. The Staffordshire potters revived it with success. The pieces were shaped on the wheel and the decoration was laid on in the fluid clay called slip. Sometimes this was dark in color laid on a light background and sometimes the reverse. A liberal use was made of simple arrangements of dots, in fact the technique was that which naturally arose from the nature of the material. The slip was allowed to trickle from the spout of a vessel something like an engineer's oil can and of course there was great freedom in the disposition of the lines. A fusible lead glaze supplied a brilliant finish to the pieces. These early potters were experts in developing the decorative possibilities of colored clays and colored glazes. They produced the mottled wares known as agate and tortoise shell. In fact it may be said that they manufactured the most natural clay ware of all time.

About the year 1688 two brothers named Elers came from Holland and they introduced many refinements of process and taste. These men were secretive, as potters have always had the reputation of being, and in order to guard their secrets the more effectively they tried to secure helpers of low mentality. Report has it that two skilled potters took advantage of this and by pretending to be weak minded secured employment. The result was that they gained much valuable information which they afterwards used to their own advantage.

The Elers Brothers appear to have brought to England a knowledge of the German process of salt glazing but some authorities have considered that they were anticipated by John Dwight of Fulham who in 1671 was granted a patent "for having discovered the misterie and inventions of the Cologne ware." Whichever claim be true and unless new records should be discovered the point cannot be proved either way, the Staffordshire workmen were making quantities of salt glazed pottery by 1720. To this ware they devoted their most earnest efforts and in the production they found their greatest success. Solon has written of this product in the following passage:

"Had we to describe in a few words a piece of this ware, we would say: it is a white earthen vessel, daintily formed, delicately embossed with graceful arabesques or flowers, and which shows, under a pellucid glaze, brightening but not hiding, the sharpness of the most minute details, a semi-transparence in the thinnest parts of its substance. Would not the description read as if some sort of porcelain was intended? And yet we only applied it in our mind to English Salt-glaze, the new ware which was once opposed in England to the heavily-made and darkly-colored earthenware, the brown stone, or the clumsy Delft, heretofore the only fictile productions of the country."

The next great advance was made by the famous Josiah Wedgwood who developed the factory system of division of labor. The earlier potters had carried their work through individually. Wedgwood employed skilled designers, skilled wheel men and skilled decorators, so that any piece of work passed through a number of hands and each successive process was brought to perfection. This was a serious loss from the point of view of the craftsman but it laid the foundation for the supremacy in pottery production which England still holds. Wedgwood was a tireless experimenter and succeeded in making several varieties of pottery which were entirely new. He spent money freely in hiring skilled men and his work stands unrivalled to the present day.

There only remains to tell the story of porcelain and in this I must be brief or I shall overtax your patience.

We have seen that the influence of the Chinese ware was felt in various European productions but the only result has been a series of imitations. The slip-coated wares of the East and the enameled wares of Spain, Italy, Holland and France were made white only by surface treatment. They lacked the substance of porcelain in that they were neither dense, sonorous nor translucent.

Though the records are confused and the identification of specimens difficult certain facts are fairly well established. These I will give briefly before proceeding to discuss the manufacture in general. Documentary evidence points to the making of porcelain, probably as an experiment, at Venice as early as 1519 and at Ferrara about 1575 but specimens of these wares are unknown. At Florence about 1580 the famous Medici porcelain was made. This is now extremely rare. There is no example in this country and England possesses only six pieces. France can show only a single piece of a porcelain made at one of the faience manufactories at Rouen in 1690 and at St. Cloud the first real factory of soft porcelain was established in 1695.

It will be well here to explain the meaning of the term "soft porcelain." The porcelain of the Chinese has already been mentioned as the prototype and the inspiration of European and Asiatic white wares but the production of this was dependent upon the possession of a particular clay and its associated rock and the use of an especially intense fire. The porcelain of France was an evolution from fine faience and was produced at the temperature used for the cruder ware. The body or paste consisted of a mixture of fusible and infusible ingredients such as potash, alum and sand which were mixed together and agglomerated by fire. The mass was then ground to a fine flour and a small quantity of plastic clay was added in order to make a workable paste. After being shaped the pieces were subjected to a degree of temperature just sufficient to develop density and translucency. Too high a temperature would cause the ware to soften and even to melt to a glassy mass. For this reason and also from the use of a very fusible glaze this ware is known as soft porcelain or pate tendre and can be regarded only as an imitation of the true or hard porcelain. Nevertheless, such was the skill of the French potters and decorators that magnificent pieces were eventually made.

The Factory at St. Cloud was followed by many others established in accordance with the fashion already mentioned, by Dukes and Princes. It was a profitable trade then to profess the ability to make porcelain. Anyone with sufficient assurance could secure a lucrative job until his failure found him out and then all he had to do was to report to the nearest Prince and repeat the story.

Passing over the abortive attempts of this class we find a successful venture established at Vincenees about 1750. Three years later the King of France became the owner of a third interest and the title of Royal Manufactory was bestowed. In 1756 the manufactory was removed to Serves and the King became sole owner. The soft porcelain of Sevres is so well known that the subject may be left at this point except to say that about the year 1804 Sevres finally abandoned the manufacture of soft porcelain and has since made hard porcelain exclusively.

For the beginnings of hard porcelain in Europe we must turn to Germany. The King of Saxony had formed a large collection of Chinese porcelains and many attempts were made to produce a similar ware. In the year 1710 porcelain earth or Kaolin was discovered. The story goes that this was at first sold as a hair powder and in this form it came under the notice of a chemist named Bottger. Having already studied the composition of the Chinese wares this man was now able to manufacture a true hard paste, the well known Meissen or Dresden porcelain. Though an endeavor was made to keep the secret of the composition it was revealed by a workman and the usual crop of small factories sprang up. Some were successful but many failed and are now known by only a few specimens all nearly alike and to be identified only by experts. Soft porcelain never found a home in the German states.

Holland, Russia, Italy, Spain and Portugal all joined the ranks of the porcelain makers but it is not necessary here to discuss their productions.

Once more the story passes to England and the rest of it must be dismissed in a few words. English porcelain had no connection as to its beginnings with the manufacture of earthenware or the cruder forms of pottery. The first factory was established at Bow, near London in 1744. The composition of the paste was based upon the soft porcelain of France but before long there came into use the substance which has ever since characterized English porcelain or china, phosphate of calcium in the form of burned bones. From this ingredient English china is known in this country as bone-china.

The factory at Bow was followed in 1748 by one at Chelsea at the other side of the Metropolis and this in turn by a factory at Derby in the midland counties. The owner of the Derby factory eventually bought out the others and thus there came into being the ware known as Chelsea Derby.

The works at Worcester were established in 1751 and this concern is the only one of the pioneer manufactories which has maintained an unbroken existence.

During the nineteenth century many enterprises were undertaken in Europe and America but they have not yet been so mellowed by the atmosphere of time that their place may be assigned in History.

DINNER IN HONOR OF W. H. H. ROGERS.

December 15, E. G. Eisenhart, of Horseheads, N. Y., gave a dinner in honor of W. H. H. Rogers, formerly of Rochester, who, like the host, is an ex-president of the N. B. M. A., which was a most enjoyable affair. Nearly all of the brick manufacturers of western New York were invited, and needless to say, accepted the invitation. Among the guests were two other ex-presidents of the N. B. M. A.—M. E. Gregory, of Corning, and Charles M. Crook. Mr. Rogers is now a member of the New York State Industrial Commission, and spends most of his time in New York City, where he anticipates greeting all his old N. B. M. A. friends during convention week in March.

CLAY COMPANY TO GIVE BONUS.

H. H. Titsworth, president of the Clay Products Company, Brazil, Ind., addressing employes and employers in the first annual banquet January 18, announced that the plants in Brazil are to be operated on the profit-sharing plan beginning February 1. The company employs about 180 men and boys, and it was estimated by the officials that the monthly bonus will be $3,355.

OHIO KILN COMPANY'S NEW YEAR'S GREETING

Brick and Tile Manufacturers May Make 1917 a Year of Record-Breaking Prosperity by Installing Their Improved Up and Down Draft Kilns.

THE GREAT MINT of Time has just coined for you a brand New Year. It has placed in your purse three hundred and sixty-five important days. These days belong to you. No strings are tied to them—save one. That condition is that they can't be hoarded and they can't be saved. Your deed of gift says that they must be spent. Beyond that they are yours to do with as you please.

This is the wealth with which you begin the New Year. No man has more; no man has less. Barring illness, accident or death, these days that you have ahead are more absolutely within your power and under your control than any other thing you could possibly possess.

We talk a lot about the equality of opportunity. There is a practical road to this very equality of which we dream, and that road lies in an equal appreciation and utilization of time.

On January first, of nineteen-sixteen, looking back to New Year's Day of last year, many of us said, "And 1915 gone! It seems but a minute since it came-" Then we proceeded to celebrate the advent of a newcomer, with a round of good wishes, and told how this or that interfered with our progress and how a countless number of big and little things held us back.

The Ohio Round Up and Down Draft Kiln which is saving Mr. Pierce $35 to $40 per burn

And now another year has passed. In the year 1917 we have a great new chance. "Time has blotted out the failures of the past." We are on the starting line of a brand New Year. In the purse are three hundred and sixty-five bright new coins. Each day with the prospect and possibility.

There are two partners available for all clayworkers—ambition and determination—ambition to manufacture brick and tile of better quality, at lower cost, and a determination to remodel the old kilns, or build new ones to correspond with plans of the up and down draft system, as furnished by Ohio Kiln Co. A system that will help to make the most of all opportunities in 1917. An example of what may be accomplished is furnished by Mr. L. B. Pierce. Read his letter, and others of a similar character in our ad on page 105 of this magazine, and resolve to profit thereby.

L. B. PIERCE

Manufacturer of Tile, Brick and Hollow Blocks.

Winfield, Iowa, January 5th, 1917.

Ohio Kiln Company, Vigo, Ohio.

Gentlemen—I installed your patent up and down draft kiln, and have made several burns in it, and find it very satisfactory. We saved one-third of the time in burning, and one-third of the coal required in the old style down draft kilns.

This one-third is somewhat less than our savings have averaged, this makes about $35.00 or $40.00 saved in each kiln burned; besides this, the metallic ring so desirable in tile, is much better with tile burned in the up and down draft kiln than those in the old way of burning. I can cheerfully recommend your up and down draft kiln, and have decided to install it in my other kilns.

I have been in the business of drain tile manufacturing forty-one years, and have seen several different patents of kilns, but yours is the first that I have found better than the down draft kilns in general use. L. B. PIERCE.

BUILDING OPERATIONS IN MINNEAPOLIS.

There has been quite a contest in Minneapolis, over a proposition to open an extension of Mary Place from Eighth street, north to Seventh street. It was claimed that if this were done, there would be a large addition built to the Hotel Radisson, and the front would face the new street. Against it was the plan of the Dayton Company, department store, which has an interior loading platform in the rear of its present building, that would be sadly shortened by the proposed street, and also plans for a nine-story addition to the present building, to cost $250,000. After the council considered the proposition, it decided against the new street, and the Dayton company took out the permit for the addition, to cost $250,000. The McMichael Investment Company also planned an arcade building on Seventh street, where the proposed new street would go through, and has changed its plan from a $65,000 building to an office building of ten or more stories, to cost possibly $200,000.

A remodeled 30-foot kiln in which "Brick are burned as hard on the bottom as on the top"

POWDER EXPLOSION DAMAGES BRICK PLANT.

The New York and New Jersey Brick Company, of Kingsland, N. J., in common with many other manufacturers, sustained severe damages when the munitions plant of the Canadian Car & Foundry Company's plant was destroyed by explosions. In commenting on the terrific force of the explosion, the New York Times says: "The force with which the projectiles struck was seen in the condition of the New York and New Jersey Brick Company's plant, which was bombarded at a distance of some 300 yards. The thick brick walls of the plant were penetrated in many places and thousands of manufactured brick were powdered and broken. The loss at the brick plant was estimated at $30,000."

Our railroad friends can hardly plead poverty at the outset of this year if the published figures of earnings and dividends mean anything.

DANGERS OF NARROW ROADS.

WHAT IS MORE exasperating than to meet a heavily loaded wagon in a narrow, steep, rocky road without room to turn out? If you have the lighter vehicle it is "up to you" to back out and give the other fellow the right of way, especially if he is the "bigger" man. Sometimes in endeavoring to squeeze past, you run into an obstruction and either upset or break some part of the rig. Both courses are dangerous, and more especially so if you happen to be driving a young, skittish team stead of the old family "mare."

Not long ago the photographer who was taking the moving pictures for the new Du Pont "Road Building" film had set up his camera with a view of showing a short section of a narrow, rocky road. At that moment along came a boy pushing a bicycle followed by two men in a buggy. The horse became frightened, and in endeavoring to turn out for the boy, ran over a large boulder, tipping both men out and breaking the buggy.

The photographer, being a true "movie" man, seized the opportunity to run our film on a "scene." Fortunately no one was hurt, and the film was such a good illustration of the results of bad roads that it was incorporated into the body of the "Road Building" film.

No one who has seen this film, which is an education in road building in itself, can remain a passive non-supporter of the good roads movement. It contains scenes taken from actual construction, and shows the improvement and conversion by the best and most modern methods of our worst roads into the various types of smooth, hard surfaced, easily traveled highways.

The Du Pont Company, always an ardent supporter of public movements, has made this film with a view of loaning it to responsible parties for showing at meetings of all kinds having for their objects the aiding of good roads.

GOOD ROADS AND FARM VALUES.

The influence of road improvements on the value of rural property was stated in a letter recently sent to the Manufacturers' Record by the president of the Baltimore Commercial Bank, who wrote: "Around my home town in Virginia property could be bought three years ago for $60.00 to $80.00 an acre. We put a fine road several miles through that county, and today you cannot buy anything for less than $100.00, and some is held at $150.00 per acre."

PAVE WITH BRICK—
FOR ECONOMY—
PAVE WITH BRICK

NEW JERSEY CLAYWORKERS MEET IN ANNUAL CONVENTION AT NEW BRUNSWICK

THE third annual convention of the New Jersey Clayworkers was held at Rutgers College, New Brunswick, N. J., December 27 and 28, with about one hundred delegates in attendance. The death of Charles Weelans, of Trenton, the president of the association, who died early in December, was announced at the opening of the first session, and tributes to his memory were paid by Charles A. Bloomfield. A program of a more or less technical nature had been arranged by Mr. George H. Brown, director of the ceramic department at Rutgers.

Wednesday morning Prof. C. W. Parmelee, of the ceramic department of the Illinois University, spoke at length on "The Fundamental Characteristics of Clays," illustrating his talk with stereopticon views, after which Walter A. Hull, of the ceramic department of the Illinois University, spoke on "The Fundamental Characteristics of Clays," illustrating his talk with stereopticon views, after which Walter A. Hull, of the Bureau of Standards, Pittsburgh, read a paper on "Heat Transmission." During the afternoon session, a number of interesting papers were delivered, including: "Locating the Most Favorable Composition for Body and Glaze," by Phanon H. Swalm, of the Trenton Fire Clay and Porcelain Company, of Trenton. "Notes on Porcelain," by A. V. Bleininger, of the Bureau of Standards, Pittsburgh, Pa. "Artificial Freezing Tests for Clay Products," by W. L. Howat, Atlantic Terra Cotta Company, Perth Amboy. "Pyrometer Possibilities," by W. A. Hull, of Pittsburgh, Pa. Discussion—"The Coal Situation in New Jersey." Discussion—"Are New Jersey Red Burning Clays Particularly Susceptible to Scumming?" In the evening an informal dinner was served in the banquet room of the Hotel Klein, which was participated in by all the delegates, and proved a very enjoyable affair.

The Thursday morning session was opened by a most interesting paper on "Industrial Co-operation," by H. C. Mueller, of Trenton, and which we give in full.

Industrial Co-operation.

Gentlemen of the Convention:

Whenever industrial phases or problems are considered nowadays, we hear the word "Co-operation." When we talk about the war and consider the marvelous power of Germany, we credit the German system of co-operation with it. Co-operation is praised by nearly everybody, and yet it seems that it is but poorly understood or comprehended in our country.

Our own government is making serious efforts to co-operate with our industries, and has many experts at work to find ways and means to accomplish desirable results.

The average business man of this country, however, sees in co-operation merely a somewhat secret and concealed pact with his friends and competitors in business to regulate prices. He thinks co-operation means economic or financial agreements or manipulations, by which the interests of the co-operators may be advanced. Thus we have our trusts and labor unions.

These organizations claim, of course, that they are based on progressive and even altruistic principles; but in most cases these protestations cannot be taken seriously.

Whenever an enthusiast proposes a real co-operative movement, based upon the work itself, he finds himself misunderstood and perhaps laughed at, as most manufacturers have an idea that co-operation in work, exchanging views concerning experiences with materials or methods of work, etc., would be dangerous, as it would mean the giving away of formulae and trade secrets. They will not hesitate to exchange confidences concerning credits, they will without hesitation open their books and exchange reports of accounts with their competitors, but they would not for a moment think of disclosing their experiences with certain materials or tell each other what results they had with formulae or apparatus of a certain kind.

I can understand this peculiar condition of mind very well. Most of our directors, owners or general managers of work are products of the counting room, the office. They understand and appreciate the advantages of co-operation in their business—the business of the office, of the salesman, the financier—yet they do not conceive that a much greater benefit can be gained by a co-operative policy concerning the work itself, that, in other words, the shop may profit as well as the office by co-operation.

Much of the fear of teaching outsiders something is traditional with the potter, especially the so-called empirical or practical potter, who has received his sacred formulae as a heirloom or rather an inheritance from his father, with the solemn admonition never, never to part with them, to let no mortal eye seem them, to keep them always on his person and never open that little book when somebody else should be in the room.

Herman C. Mueller, Trenton, N. J.

And so it has happened that this old-fashioned system has provided many a numbskull with a lucrative position and given him a positive power over his employer or boss whom he holds in the hollow of his hand. The "boss" had as a matter of course a holy or unholy respect for this little book and would never accumulate sufficient courage to propose or suggest any kind of technical co-operation which would open this little mysterious book to profane or greedy eyes.

This may sound somewhat medieaval, but I am sure that much of this "monkey business" is in existence today.

The American Ceramic Society and its branches have opened a wide breach in this "system" and have let a good deal of daylight in. They continue to work and spread the gospel of light and liberty without resting.

And so we may take it for granted that a wholesome, rational and real co-operation must come from the ranks and through the efforts of the workers, the technicians, the scientifically trained men, if the merchant and the empirical workers will not open their eyes.

I am talking of my own experiences. In all the conventions and meetings of the tile manufacturers which I have attended, the consideration of prices, discounts, terms and details of credits, freight allowances, in fact commercial and financial considerations prevailed throughout to the complete exclusion of technical or artistic topics. Several efforts made by someone to start a conversation in respect to such subjects were met with embarrassed or contemptuous silence.

One peculiar and amusing incident I will relate. Many years ago, while I was connected with Karl Langenbeck, a prominent tilemaker asked him to assist him to obtain a clearer white glaze for his wall tile which showed a yellow tinge. As I was going into the neighborhood of this gentleman, Mr. Langenbeck asked me to step into his factory, examine his kilns, his method of firing, etc., and of course get his formula for white glaze. When I asked him for this information, he gave me what I call a "horse laugh" and said, "Oh! You want my formula? Well, ask again." I did not ask again.

The scientific man has done a great deal for our industry, and he will do a great deal more. His work was and is always hard and difficult, as he has to swim against the stream, has to battle against ignorance and egotism without much positive backing. But he must win out, not only because he is right, but because competition at home and abroad will drive our work into the direction of scientific technic.

What can we, who are not technicians, do? We can do a great deal. We can before all things bury traditions which interfere with modern progress. We can listen to the technician, give him our full confidence, our honest views and experiences, help him in his experimental work, not half-heartedly, but enthusiastically; in fact, co-operate with him in the full sense of the word.

We must furthermore combine to further technical education. We have but a few ceramic technical schools or classes in this country, if we compare our own institutions with those of the European industrial nations, and even these few schools or classes are but poorly attended. They should be jammed with pupils, and the potters and clayworkers should never let up in rational agitation for more and better technical educational facilities.

I am not a prophet nor the the son of one, but I believe the time will come, and will come soon, when this country has to realize the necessity of a broader and more intimate and careful technical training of our working forces.

It is true, we lead in many respects. We build the greatest bridges, the highest buildings; we tunnel below rivers and cities; we have the most wonderful transportation facilities in our great railroad systems; we lead in agricultural equipment, in machinery, tools, etc.; but most of us are still engaged in producing the smaller things necessary to our life and comforts, and for this work we need the intelligent individual worker, the man proud of his work and skill, in love with his occupation. The destiny of the human race should not and cannot point in the direction of the machine and the man as its annex.

To illustrate our own position as manufacturers and employers of labor, allow me to quote an old German manufacturer, Herr Schoenau, who has been called the "Krupp of Porcelain." I listened to a short speech of this successful manufacturer during a visit. The occasion was a banquet, celebrating the opening of the Ceramic Art School of Lichte-Wallendorf in Thuringia. Herr Schoenau said: "My success is in a great measure due to my efforts to educate my workmen. It is not proper to consider the training and education of the working forces from an altruistic standpoint only. It is a matter of business, of good business also. The manufacturer should not merely send a check once in a while to an educational institution whenever he thinks he can afford it. He should rather consider the expense of educating his workmen as a fixed charge against the cost of production and pay it as he does his insurance or other fixed charges."

All this means that we should come together, to confer, to co-operate in our daily work with an open mind, with a liberal spirit, without too much egotism. (Applause.)

Mr. Mueller's paper was followed by two others, entitled "The Effect of Time in the Vitrification of Clay Products," by George H. Brown, of Rutgers College, and "The Practical Value of the Microscope to the Potter," by Professor Parmelee. Following this the subject, "The Relative Properties of Imported and Domestic Flints in Ceramic Bodies," was discussed at some length.

The afternoon session was devoted to election of officers which resulted as follows: Howard Valentine, of Woodbridge, president; A. M. Maddock, Trenton, vice president, and George H. Brown, Rutgers College, New Brunswick, secretary.

WISCONSIN CLAYWORKERS TO MEET AT MILWAUKEE, FEBRUARY 1 AND 2.

A hearty invitation to meet with the clayworkers of Wisconsin in annual convention has been received from Secretary S. Weidman, of Madison. An interesting program is in course of preparation and it is anticipated that a majority of the brickmakers of the state will be in attendance at the Republican House, Milwaukee, February 1 and 2.

NEW DEPARTURE FOR THE BONNOT COMPANY WHICH WILL BE OF MUCH ADVANTAGE TO THEIR PATRONS.

In order to more efficiently serve the trade, The Bonnot Company, of Canton, Ohio, has inaugurated a new department of ceramic engineering, and has sent us the following announcement in regard to same:

"We are pleased to announce to the trade that we have completed arrangements for our new ceramic engineering department, and have obtained the services of Mr. S. C. Karzen, ceramic engineer, to conduct same. The new department places its services gratis at the disposal of the clayworkers of the country, and will be glad to aid them in their clay mining, manufacturing and burning troubles.

"Mr. Karzen is a 1910 graduate of the Ohio State University, ceramic engineering. He was with the Denny Renton Clay and Coal Co., of Seattle, Wash., for a year. Later with the American Sewer Pipe Co., of Akron, Ohio, for five years, during which period he managed four of their plants. He also spent a period with the Cambria Clay Products Co., of Blackford, Ohio, as superintendent. His experience covers both brick and hollow ware. He is an expert burner, with a wide experience in handling different types of clays and wares.

"He is a member of the American Ceramic Society, for whom he has written a number of articles, some of which have been printed in The Clay-Worker at different times.

" 'Notes on the Regulation of a Waste Heat Double Decked Dryer,' 'Design of Waste Heat Furnace for Paving Brick Dryer,' 'Notes on the Cooling of Vitrified Sewer Pipe,' 'Defects Encountered in Burning of Vitrified Hollow Ware, and Methods of Elimination,' are some of his publications.

"We feel that we have been fortunate in obtaining the services of Mr. Karzen, and we hope that the clayworkers will avail themselves of the opportunity to use same.

"THE BONNOT COMPANY."

Ambition may encounter some difficulties, but it is greed that brings most of the real troubles to men.

REVIEW OF THIRTY-NINTH ANNUAL CONVENTION OF THE ILLINOIS CLAY MANUFACTURERS' ASSOCIATION

THE Thirty-ninth Annual Convention of the Illinois Clay Manufacturers was held in the Beardsley Hotel, Champaign, Ill., January 15, 16 and 17. For some unaccountable reason the attendance was very small although a most interesting program had been arranged. Many matters of vital importance to the brick and drain tile trade were considered and acted upon so that much was accomplished although the attendance was disappointing. It is inconceivable that manufacturers of clay products can be so blind to their own interest as to allow anything to interfere with their association work. However those who attended entered enthusiastically into the discussions and there was not one there but felt he had been repaid many times over for the trouble and expense he had gone to to be present.

President Buckley was unavoidably prevented from attending the convention so that the reading of the president's annual address was dispensed with. The first paper to be read was by R. K. Hursh, of the Ceramic Department of the University of Illinois. The title of his paper was Development of the Continuous Tunnel Kiln. He reviewed the historical development of tunnel kilns and described some of the more important types especially those which have proven commercially successful.

Following the discussion of the paper, Mr. T. N. McVay, of Streator, read a paper on the Construction of a Round Down Draft Kiln. He illustrated his paper with blue prints and lantern slides. He pointed out interesting features emphasizing some of the new wrinkles in the construction of the modern round down draft kilns, one of which was the use of car springs for banding irons to give necessary leeway for expansion.

Prof. C. W. Parmelee, of the Ceramic Department, closed the morning program with a most interesting address on the Clay Working Industry in New Jersey. In this he covered briefly the history of ceramics in New Jersey, the rank of state in production of various classes of ware, geology of the raw materials, location of the beds of raw material and the description of the two important centers, Trenton in the western part and Perth Amboy and Woodbridge in the eastern part of the state. He also discussed the manufacture of common brick, pointing out the most important differences in the methods of manufacture in the southern part of the state as compared with that in the northern. Lantern slides were shown of the typical plants, the products and buildings in which products were used, for instance the Woolworth Building and panels in grill room in the McAlpin Hotel, New York City. Examples of chemical stoneware manufactured at Keasbey, N. J., and sanitary ware and pottery made at Trenton were displayed.

The afternoon program consisted of four well prepared papers. Dr. Washburn, head of the Ceramic Department, read a paper on Ceramic Chemistry, discussing the chemical principles involved in the fusion and deformation of silicates in ceramic bodies and the softening temperatures of seger cones. These points were illustrated by interesting experiments.

Mr. H. C. Arnold, of the Ceramic Department, presented a valuable paper, describing the Richardson continuous kiln. This paper will appear in a subsequent issue of the Clay-Worker.

The other two papers on the program were by members of the Geological Survey, Messrs. G. H. Cady and Stuart St. Clair. That by the former dealt with the Geological occurences of clays in western Illinois, along the coal basin, touching such points as Rock Island, East Alton, Whitehall, Ray, Colchester, Carbon Cliff, Lowell, Deer Park and Ottawa, while the paper by the latter was on the subject Geological Occurrences of Refractories near Anna, Ill. Mr. St. Clair gave the geology of southern Illinois region so as to show the relation of the clay deposits to the geology of Southern Illinois the conclusion being drawn that the clay deposits were formed at a very much later date than the other rock formation of the area in which they were found. By a geological study of these clays it was determined that they occurred in deep depressions of a soluble limestone area, the clay being deposited by water, so that large deposits of these clays will be found only where there were large depressions over which the waters of the sea advanced. There are three producing mines in the region described, one operated by open pit, the other two by shafts. These fire clays are highly refractory and are being successfully used as a substitute for the European fire clays which were imported prior to the war. These clays are excellently adapted to use in the manufacture of crucibles, glass pots, etc.

Monday evening the delegates were entertained by an interesting stereopticon lecture by Prof. James M. White, of the University. He gave a discourse on Ceramic Products in Architecture. He stated that brick is the best and at the same time cheapest permanent building material known and is destined to receive more consideration. He said that brick work is not best when new, like a suit of clothes, but needs the mellowing effect of time and should be designed with that thought in mind. He declared that cement mortars have burned the colors out of our brick, and that they should be substituted by lime mortar which will preserve the colors and give better jointing effect. He showed slides to illustrate the points made.

Prof. White stated that common, ordinary brick, if laid up in good careful design make an excellent building. He urged that more attention be given the cutting of the brick and the making of brick shapes. Immediately after Prof. White's talk the delegates were escorted to the Orpheum theater, where a moving picture film of brick paved country roads was shown. This film is the property of the Danville Brick Co.

Tuesday morning was devoted to the subject of Cost Accounting, Mr. T. H. Scovill, of Urbana, Ill., made a most interesting talk on the subject of cost systems, which opened up the subject and caused an enthusiastic discussion. In introducing his subject, he dealt with the history of brick and the early knowledge of cost, comparing same with the conditions today. He dealt at some length on the value of keeping the cost, and the methods of doing same. He urged the importance of a uniform cost system to enable men in the same line to compare conditions, for by comparison the cost can be reduced. If there is no basis for comparison, there is no basis for criticism. The items for uniform cost system which cause discussion are interest charges, distribution of depreciation, royalties, unit period, indirect expense and unit cost on units made. Mr. Scoville analyzed each item thoroughly and concluded by stating that the manufacturers should pay especial attention to the four M's, namely, men, money, material and machinery.

A lengthy discussion followed opened by Mr. Haeger, who stated that the government is going to charge 2 per cent on the profits instead 1 per cent and that this is only a forerunner for a greater charge, so that there is an urgent need for cost keeping. Mr. Haeger stated that the proper distribution of the factor of depreciation is most important especially in the items of clay bank, machinery, kilns and buildings. He, himself allows 2½c per ton for depreciation in the clay bank, 2½c to 3 per cent on cost of buildings, 5 per cent on cost of kilns and 10 per cent on machinery and tools.

Secretary Huckins said he thought the present conditions were a God send in a way for they awaken the manufacturers to a sense of the need of better cost accounting.

Mr. Douglas Stevens spoke of the cost accounting system advocated by the Face Brick Association, also the one advocated by the Illinois Association, which had been discussed for four years, but nothing accomplished. He urged that the manufacturers be more friendly, tell the truth and the whole truth, exchange their cost records and prophesied that under those conditions, the manufacturers could not be kept from the annual meetings simply because then they would realize what a wonderful amount of good can be accomplished through co-operation. A motion to the effect that cost accounting data covering entire year be exchanged by the members was made, discussed and favorably voted upon.

Two papers were read at the afternoon session, one on The Need of Better Prices by Jas. E. Randall, of the Clay-Worker, and the other on the Dealers View Point by Miss Astrid Rosing, of Chicago. Both covered the subjects in an interesting manner. These papers will appear in a subsequent issue of The Clay-Worker.

Following these papers there was a lively discussion on selling wherein many valuable points were made, one of especial interest was the correct methods of making bids on brick structures.

Following this discussion the convention adjourned for the day, the delegates going to the meeting places of the various groups to consider their own individual troubles. Tuesday evening an enjoyable banquet was participated in by all present. Informal speeches were made.

Wednesday morning was devoted to a business session in which the following resolutions were adopted:

Whereas, The Thirty-ninth Annual Convention of the Illinois Clay Manufacturers Association owes much of the success of its meetings to the various organizations and friends who have assisted in every possible way, therefore be it

Resolved, That our secretary be instructed to convey the thanks of the Association to the Champaign Chamber of Commerce, the Beardsley Hotel and the Orpheum theater for their hospitality and numerous courtesies; to the Department of Ceramics of the University of Illinois, the State Geological Survey and individuals who have contributed to our program.

Whereas, The series of county scholarships in Ceramics at the University of Illinois, are available upon recommendation of this Association and whereas, these may be more fully utilized than at present to the great advantage of the clayworking industries and of the people of our state, therefore be it

Resolved, That our secretary use every possible means to co-operate with the Department of Ceramics in bringing these scholarships to the attention of all members of our association.

Whereas, The Department of Ceramics has been permanently housed and the corps of instructors has been greatly augmented during the past year, therefore be it

Resolved, That the appreciation and congratulations of this association be respectfully tendered to the President and Board of the University of Illinois.

Wm. Hammerschmidt,
F. R. Carter,
Douglas Stevens.

The election of officers resulted in the following selection: President, Douglas Stevens, Cayuga, Ind.; Vice President, W. C. Holmes, Springfield, Ill.; Secretary, A. E. Huckins, Champaign, Ill., and Treasurer, G. C. Kanne, East Peoria, Ill. The Advisory Board of the Ceramic School which consists of four members; namely, A. W. Gates, Monmouth; F. W. Butterworth, Danville; W. D. Gates, Chicago, and A. E. Huckins, Champaign, was enlarged to seven members, the other three to include one member selected from each of the refractory, cement and glass industries of Illinois by the representative bodies.

Immediately after adjournment the delegates made a trip to the University and made a careful inspection of the beautiful Ceramic school.

ILLINOIS UNIVERSITY BULLETIN.

The Department of Ceramic Engineering of the University of Illinois has issued a new bulletin describing in detail the courses, both graduate and undergraduate, which it offers in Ceramic Engineering and Ceramic Chemistry. The bulletin also contains an illustrated description of the new laboratory and its equipment, and a list of the names and addresses of the graduates of the department since its establishment. Copies of this bulletin can be obtained upon request by addressing, Department of Ceramic Engineering, University of Illinois, Urbana, Ill.

RESEARCH FELLOWSHIPS IN ENGINEERING EXPERIMENT STATION, UNIVERSITY OF ILLINOIS.

To extend and strengthen the field of its graduate work in engineering, the University of Illinois maintains fourteen engineering experiment station research fellowships. One other such fellowship has been established under the patronage of the Illinois Gas Association. These fellowships, for each of which there is an annual stipend of $500.00, are open to graduates of approved American and foreign universities and technical schools. Appointments to these fellowships are made and must be accepted for two consecutive collegiate years, at the expiration of which period, if all requirements have been met, the degree of Master of Science will be conferred. Not more than half of the time of the research fellows is required in connection with the work of the department to which they are assigned, the remainder being available for graduate study.

Nominations to these fellowships, accompanied by assignments to special departments of the Engineering Experiment Station, are made from applications received by the director of the station each year not later than the first day of February. The nominations are made by the station staff, subject to the approval of the executive faculty of the graduate school and the president of the university. Nominations are based upon the character, scholastic attainments and promise of success in the principal line of study or research to which the candidate proposes to devote himself. Preference is given those applicants who have had some practical engineering experience following their undergraduate work. Appointments are made in the spring, and they take effect the first day of the following September. Vacancies may be filled by similar nominations and appointment at other times.

The Engineering Experiment Station, an organization within the College of Engineering, was established in 1903 for the purpose of carrying on investigations in the various branches of engineering, and for the study of problems of importance to engineers and to the manufacturing and industrial interests of the state. Research work may be undertaken in architecture, architectural engineering, ceramic engineering, chemistry, civil engineering, electrical engineering, mechanical engineering, mining engineering, municipal and sanitary engineering, physics, railway engineering and in theoretical and applied mechanics.

The work of the station is closely related to that of the College of Engineering, and the heads of departments in the college constitute the administrative station staff. Investigations are carried on by members of the station staff and other members of the instructional staff of the College of Engineering, by special investigators employed by the station, and by the research fellows.

Additional information in regard to the research fellowships may be obtained by addressing the Director, Engineering Experiment Station, University of Illinois, Urbana, Ill.

THE DEVELOPMENT AND APPLICATION OF A BONUS SYSTEM

By Spencer M. Duty.*

THE SUCCESS of an industrial enterprise depends upon the combined efforts of employer and employe. Between the two is a mutual dependency and the development of the sense of this dependency is vital. It should find its expression in active co-operation. The ideal condition obtains when the interests of both are merged in the welfare of the common enterprise. To realize the ideal it is essential that the activities of both shall be so correlated that what benefits one shall likewise benefit the other.

The application of a bonus system for wage earners reflects a desire to bring about a greater co-operative spirit and to improve the old and established methods of paying employes, for example, the day wage, the salary, or by piece work. In order to promote this co-operation the bonus system should embody the mutual benefit of employer and employe, and provide a wage for the employe which is not only a living wage but which, with the bonus payment, will be higher than the going wage. Furthermore, the bonus system or other similar effort which savors of petty discipline will defeat the purposes for which it is intended.

There are several methods which seek to arouse the co-operative spirit in employes.

Prominent among them is the profit-sharing plan. This has its greatest appeal to the more intelligent employe, to him who can wait for a return, and who has the foresight to prepare for the future. It is usually distributed once a year, being based upon the profits of the company. Much of its force may be lost when applied to the average wage earner in whom the qualities of sustained interest and foresight are rarely found. When linked with some plan of acquiring stock in the company its appeal is only to those who expect to hold their positions for a very considerable time.

Another method is a bonus paid yearly, many times being nothing more than a gift. When based upon length of service it escapes the charge of paternalism which has so often aroused the opposition of the laboring man. Any plan based upon the good will of the employer is liable to be viewed with suspicion by those whose interest and co-operation is sought. With the lack of a definite basis for making the distribution and the uncertainty of future bonuses the plan is robbed of vital elements.

Speaking of this and other plans, Collier's recently said: "Co-operation between employers and employes is continually helpful as long as the profit-sharing and other methods are kept on a business basis. Welfare work and such profit-sharing as is given by employers out of the goodness of their hearts is usually not successful."

The viewpoint of the average wage earner is not extensive. He sees from month to month, from pay to pay, and so an appeal to him for co-operation must be made at frequent intervals if he is to be encouraged to greater effort. Once a year is too infrequent a period to reach any but the more intelligent and far-seeing employe, and as we are dealing primarily with the day-wage earner, a plan involving more frequent returns is necessary.

The average wage earner does not understand profits, and naturally doubts any plan based upon them. Furthermore, the successful bonus system, the one which will arouse the co-operative spirit, must be upon a business basis. The problem then becomes one of devising a system which has the merits of those already in use but which offsets their weakness with features which insure a ready and active response, and which meets the needs of the industry for which it is devised.

Broadly speaking, there are two classes of bonuses, one based upon continuous service, the other recognizing quality and quantity of work performed. However, that based upon continuous service permits only of a small payment, and that only to an employe having the required length-of-service qualification. The bonus paid for quality and quantity of effort admits payment at frequent intervals, and therefore possesses the necessary incentive for greater effectiveness, regardless of length of employment. As a rule, under this plan a greater bonus may be paid than is possible with the yearly bonus. All these factors contribute to its greater desirability from the standpoint of employer and employe.

We believe that the bonus which meets the needs of our business is one which pays more money for greater effectiveness, the former depending upon the accomplishment of the latter.

In developing a bonus of this kind four steps are necessary:

First: Investigate and determine what operations or economies permit of the payment of a bonus.

Second: Set a standard for the basis of payment.

Third: Determine the value of results better than the standard.

Fourth: Determine a plan whereby a portion of such greater value will be divided among those who have made it possible, in other words, the rate of payment.

First—In the determination of what permits of a bonus it is necessary to keep clearly in mind that the value of an improvement to the company over the standard should be greater than the total amount of bonus paid for that particular operation or economy. It is easier to apply a bonus to some operations than others. Number one material has a definite greater value compared to off-grade material. A saving in fuel is positive, the difficulty being in establishing with reasonable accuracy the actual consumption during a month. Regular production approaching the maximum production of the plant directly affects the unit cost of fixed expense, and to a lesser degree that of certain semi-fixed expense and therefore is to be encouraged. Departmental labor economy can also be determined and placed under a bonus.

A bonus based upon maintenance, oil, or similar items would have an element of danger. Such a bonus might induce cutting below the most efficient point, resulting in an apparent saving which would be the cause of a much larger expense later.

Second—After having chosen the operation or economy for the bonus, it is necessary that a standard be set. This standard should be as nearly as possible permanent, therefore the greatest care is required. Frequent changes in the standard will destroy the confidence of the men in the system. Fluctuating factors should be eliminated if possible. A standard of a certain number of cents per ton or thousand brick for departmental labor would vary as wages varied, but a standard of hours per ton or thousand would not, and therefore forms a stable basis.

In arriving at our standards we have based them upon past experience. If data covering the operations are not available we gather them as fast as possible. Such was the case in the application of a fuel bonus to the kiln firemen. Upon most of our plants considerable stocks are carried, and it is difficult to obtain accurate inventories, thus making it impossible to base a monthly bonus upon fuel received. It was evident that we had to devise a more accurate method of determining fuel consumption per month, and after having adopted a plan, we tried it for a very considerable time to determine its accuracy.

As a rule, the standards we set are about the average performance for some time prior. A high standard will allow of but few payments of bonus and will result in a loss of interest on the part of the men, as they will not know how close they have been to earning a bonus. We preferred a lower standard and a lower rate of bonus, which insures continuity of payment. There is also the added advantage in a bonus always payable that it represents something of a barometer of plant performance. The advantage therein is to both the company and the men.

The third operation in establishing a bonus system is the determination of the value of results better than the standard set. THIS REQUIRED A DEPENDABLE COST-FINDING SYSTEM. Only with accurate knowledge can it be known whether a bonus may be paid at all. It may be that the rate will be set too low when it might have been much higher and the men thereby encouraged to a much greater effort.

It is necessary that those installing a bonus system have confidence in it. A bonus based on a guess will destroy confidence, with the result that instead of going forward steadily the system will be extended only when it appears to be imperative.

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*An address read before the Paving Brick Institute.

The operations having been chosen, a standard set, and the value of results better than the standard known, a method of paying the bonus is then determined. Who shall share it? Shall only department foremen receive the bonus or all the men in the department? Payment to a foreman alone, of course allows of a much greater payment, and arouses him to great activity. He drives the men to the utmost, and in times of labor shortage such as these probably off the plant. In our opinion such a bonus system would be almost ideal as a breeder of labor trouble.

One of the objects of a bonus system is to pay higher wages without being hurt thereby. Paying all the bonus to foremen alone defeats this object. Paying a larger share of the bonus to foremen than to the men is entirely permissible. If thought wise, there can be a scale of payment, those having the greater responsibility getting the greater bonus.

Payment may be made by a per cent. upon the wage, or the amount to be paid as a bonus can be figured as a whole and divided among those entitled to participate.

It is sometimes advisable to increase the rate of bonus as the results approach the limit of effectiveness. This would be especially true if a low standard and rate have been set in order to arouse the interest of the men upon the inception of the bonus by making it possible for them to receive one, when with a high standard and rate it might be earned seldom if ever.

It has been our practice to pay the bonus upon a month's operation. By so doing we get an average and thereby discourage stunt performances. There would be little gain to have a kiln producing a high percentage of number one brick with low fuel consumption, and pay a bonus upon it, only to have it followed by a number of bad kilns.

Thus far we have bonuses upon the per cent. of number one material and fuel economy payable to the burners, and a bonus upon average daily production for a month, payable to nearly all employes. The bonuses upon number one material and fuel economy are paid the following month and that upon production the second month following.

If an employe leaves or is discharged prior to the date of payment he loses the bonus, except when we discharge for lack of work, or when the man leaving has been in our employ at least a year and gives fair notice. The object of withholding the production bonus until the second month following that during which it is earned is to hold the men. This bonus has not been in operation for a sufficient time, however, to speak of its value in this respect.

The bonuses upon number one material and kiln fuel have been in operation for some time. They have both proved their value beyond a question of a doubt. The kiln percentage and fuel is held much more evenly, there being many less poor months. This is especially true during the winter. Having one object to work for, prevents to a large measure the disagreement and jangling common between the day and night crews.

The production bonus is a more recent development and we are not in position to speak with the same degree of assurance. Our object in starting it was to have all the men pulling for a common object. This was accomplished and production went up almost at once.

In the manufacture of paving brick, where the output can be curtailed by inefficiency in any part of the process, a production bonus seems to be a necessity. However, the benefits are less easily reduced to a money equivalent. Larger production may make it necessary to increase the force in some departments. To offset this tendency we believe that it should be supplemented by a bonus upon departmental economy.

The standard which we have set is an average or normal output. Any material enlargement of the plant would, of course, change the standard, as would the increase of any equipment, the capacity of which was less than the rest of the plant. The same statement holds for a change in product manufactured.

It is our practice to pay more than one bonus to the men. One bonus alone will tend to concentrate their attention upon one particular thing to the detriment of others equally important. A bonus upon fuel consumption alone would cause the burner to neglect the quality of ware produced. A bonus upon production would also have the same tendency unless the off-grade material was not included.

Without question there should be a balance between the different kinds of bonuses a man receives, or some bonus should be devised which includes all the important qualities of his work.

In one respect at least, the bonus system has a great advantage over piece work. It is not necessary to argue with the men or talk to them prior to putting it into effect. The basis may be determined and when a good opportunity presents itself, the bonus may be paid. There is no need to argue or convince; the bonus speaks for itself. Beyond a mere statement of its object nothing need be said. We are of the opinion it is better to say as little as possible. For a time the men are suspicious and wonder what it is all about. One can sit back and let them take their own time to become familiar with it, and come to the belief it is a good thing. The employer can well afford to wait patiently for results. If the bonus is upon the right basis he is profiting by the payments; he is getting a share with the men.

Little attention will be paid by the men until the payment amounts to at least 2 or 3 per cent. increase in their wages. Then they begin to show interest, work a little harder and finally earn 4 or 5 per cent. If the basis of another bonus is ready this is a good time to start it.

We believe that money received as a bonus has a much greater effect than the same amount received as a wage increase. To revert to the original conception for the requirements of a bonus system, the wage plus the bonus must exceed the going wage, otherwise the effect is lost because more wages are not being paid in proportion to more work.

It should not be forgotten that a bonus system is an experiment with human nature, and human nature is not susceptible to fixed rules. Whether or not bonus systems and profit-sharing plans will make for less labor trouble cannot be absolutely answered. It is known that a great deal has been accomplished in many places by them. The laboring man now demands more than a bare living wage. Profit sharing and bonuses are an effort to give him more, to give him a fair proportion of the results of a greater effort. The employer in general confronts the necessity of discovering some method, more fair and just than the methods of the past. The bonus system described illustrates the method in process of being tried by our company.

GOOD ROADS AND FIRE PROTECTION.

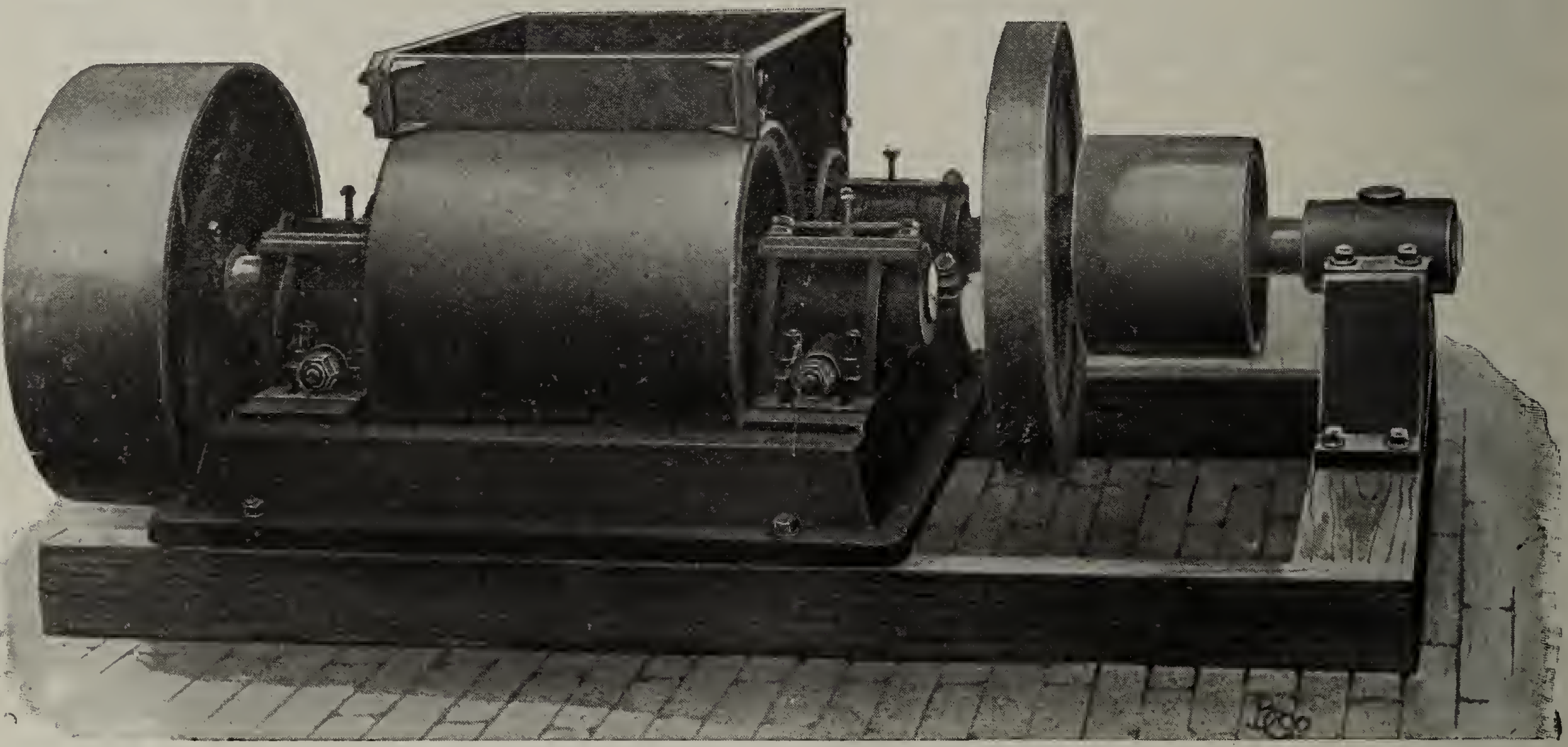
A new argument for good roads was recently furnished by a severe fire at Jersey Shore, Pa. This fire threatened to burn up the business section of the town, for the local waterworks furnished water under a pressure inadequate to fight a real conflagration. The town's fire department, supplemented by companies from neighboring towns, could do little because of this low pressure. Help was summoned from the city of Williamsport, sixteen miles distant, and in thirty-eight minutes after the call was received a large automobile engine from that place had reached the scene and its powerful pumps saved the town. In the old days of horse-drawn equipment, it would have been necessary to take the engine to the railroad yard, load it on a car, hunt up a locomotive, make the run over the railroad as well as the train service would permit, and then unload the equipment at the place needing help. All this might possibly be done in thirty-eight minutes, but there is very little probability of it. Under the new conditions, a road may be the means of saving a burning town; if bad, it delays the needed help, and if good it means safety. In the Pennsylvania case, the road was not a good one, but it was not a bad one, either. About half a mile has been improved, but the remainder is nothing but a hard shale road, kept in as good condition as possible with the materials at hand. This maintenance of the road is what saved Jersey Shore from greater loss, for persons familiar with fire-fighting agree that every minute saved in checking the spread of a conflagration is equivalent to the saving of a large financial loss.

ARBUCKLE DISINTEGRATOR BUILT FOR STRENGTH AND ECONOMY.

THE ARBUCKLE CO., of Rushville, Ind., has supplied a large number of plants with their No. 3 Heavy Duty Disintegrator as well as many others of their serviceable machines and equipment. The design of their No. 3 Disintegrator embodies every feature calculated to insure greatest strength. The bearings are divided at an angle of 45 degrees, are lined with genuine copper-hardened babbitt and are ring oiled. The distance between the rolls is regulated by the adjustable bearings on the feed roll. Each roll is driven by an independent pulley, this they claim to be a great advantage over methods in which gears, sprocket wheels or short belts are used in connecting feed roll. It is also claimed for this machine that it reduces the clay thoroughly and rapidly, leaving the clay in the best possible condition for pugging.

. The specifications for the machine are: Floor space—Length, 4 feet 8 inches; width of frame, 48 inches; width over all, pulleys attached, 8 feet; height to top of hopper, 2 feet 6 inches; height to center of rolls, 12 inches. Shafts—Four inches diameter; feed rolls, chilled iron, 24 inches diameter, 24-inch face; cutting roll, chilled iron, 14 inches diameter, 24-inch face. Cutting Bars—Tool steel, adjustable and removable, six in number. Bearings—Ring oiler, 10 inches long. Driving Pulleys—On feed roll, 30 inches diameter, 8-inch face; on cutting roll, 16 inches diameter, 12-inch face. Speed—Feed roll, 40 to 60 revolutions per minute; cutting role, 700 to 900 revolutions per minute. 20 Horsepower—Required to operate to capacity under normal conditions. Weight—6,000 pounds. Capacity—150 tons per day of ten hours.

See their advertisements on pages 110 and 111 of this issue.



The Arbuckle Company's No. 3 Heavy Duty Disintegrator.

STANDARDIZING AND SPECIALIZING.

Unless the signs read wrong, there is coming to the face brick manufacturing industry a time when there will be an earnest call felt for more standardization. For quite a while now the call has been the other way, has been for diversity and individuality. Architects have been pleading for more variety in brick, for the development of new colors and different effects, claiming at times that there is no such thing as getting too many offerings in the way of variety and individuality in face brick products.

The result is that today the offerings in face brick are so multitudinous as to be confusing even when one takes into consideration only the product of some one locality, that is, the product within what might be termed shipping distance of any given point, say, within the eastern half of the United States. This diversity is interesting for a while and it was essential that we have it. By and by, however, it is going to become tiresome as well as confusing, and for the sake of economy, the trade will likely find it advantageous to standardize and eliminate, to eliminate some of the various shades of coloring and texture and to standardize certain others and reduce the variety in offerings.

Individuality is a splendid thing in face brick, but like other good things it is sometimes possible to get too much of it. In other words, too many varying shades of color and texture, many of which too closely resemble each other to leave excuse enough for making the variation. By and by there will come a time when it will likely be found advantageous to take stock, compare notes, weed out unnecessary shades and textures that come in between something else for the sake of not only reducing the samples required to display the product, but also for economy in manufacturing and to reduce confusion in filling and shipping orders.

Color and texture variety in the face brick business has been developing very rapidly. It has been a very interesting and inspiring development, too, which, for the time being, aroused enthusiasm that of itself naturally led to still greater variety. But there is a limit and unless the signs read wrong, there is a time coming when the face brick manufacturers will need to take up the subject of standardizing in colors, styles, textures and things of that kind and the elimination of many of those which it will be found have not good enough excuse for being continued because there is something else that will answer all the purposes. In other words, it will be found that all the desired changes and effects can be secured with a smaller variety and established standards.

NO ACORN.

When James A. Garfield was president of Oberlin College, a man brought for entrance as a student his son, for whom he wished a shorter course than the regular one.

"The boy can never take all that in," said the father. "He wants to get through quicker. Can you arrange it for him?"

"Oh, yes," said Mr. Garfield. "He can take a short course; it all depends on what you want to make of him. When God wants to make an oak he takes a hundred years, but he takes only two months to make a squash."

Written for The Clay-Worker.

NOTES FROM DIXIE LAND.

THE VERY COLD and icy weather prevalent in Tennessee and adjacent sections has caused building work to be a little inactive for a couple of weeks, though some jobs are in progress. Prospects are fair for new and remodeling work in the spring. Brick and clay industries, architectural offices and representatives of brick manufacturing interests are optimistic and making many plans for 1917 usefulness.

The value of building permits for the year 1916 in Memphis, recently tabulated in the office of Building Inspector Dan C. Newton, showed a healthy increase over 1915. More than 50 per cent. of the total valuation of buildings erected in 1916 represented bungalows. Brick buildings numbered 165 at a cost of $938,745.

Atlanta, Ga., is preparing for the big annual convention of Builders' Exchanges that will be held in that city February 13-15. Large delegations are expected from many cities.

The new year started auspiciously in New Orleans. The first building permit of the year was issued to the H. H. Burns Contracting Company for the erection of a new two-story residence in Elysian Fields avenue for George Prados. Contract for all the tile work in the new building for the Grunewald Caterers in Canal street, New Orleans, has been let to Joseph Ariatti.

Nolan & Torre, architects, New Orleans, are completing plans for a three-story pressed brick front and general renovation of the larger commercial building at the corner of Tschoupitoulas and Lafayette streets, which is owned by H. T. Cottom.

Southeast Georgia cities are active and show a big development in material and construction lines. Valdosta, Albany, Thomasville and other points are moving to the front. C. D. Smith, at Albany, Ga., is rounding out thirty-one years in the building material trade. Brick, lime, lath, glass, plaster, etc., are handled by his firm. He was the contractor for the handsome City Hall, of Albany, built a few years ago.

One of the largest buildings under erection at Memphis just now is the Van Vleet-Mansfield Drug Company building at South Second and Gayoso. It will stand eight stories, being of brick, stone and reinforced concrete. There are forty-four reinforced concrete columns for the support of the building. The building will be as near fireproof as can be made. The foundation work and excavation work have been in progress some weeks. The general contract is held by the James Alexander Construction Company of Memphis. C. O. Pfeil is the architect.

At Nashville, Tenn., another three-story apartment house is being planned for the West End. Messrs. Thomas W. Gardner and Edwin E. Daugherty, of Nashville, prepared the plans for the building, which is to be arranged for twenty-four families. It will be of light brick with stone trimmings, slate roof and modern equipment.

Jonesboro, Ark., is to have a new high school building, brick, modern plumbing and heating.

At Memphis, Tenn., work has begun on the seven-story brick addition to the Goodwyn Institute public library, office and auditorium building at Madison avenue and Third street. J. H. Hollingsworth & Co. are the contractors.

Brick manufacturers of Paducah, Ky., are gratified over new tariffs that mean a saving of from 100 to 200 per cent. to them in freight rates to southern territory. The new rates became effective December 15. The victory secured by the Board of Trade will enable the brick manufacturers to compete with all others in the interior Mississippi Valley territory, and the large reduction in rates means the opening of new territory for an extensive expansion of this particular business. An example of the heavy reduction in freight rates is shown by the present rate of 7 cents from Paducah to Union City. The new tariff makes this rate 2½ cents and others in proportion.

The Building Material Men's Club of Memphis, at a recent meeting, elected the Standard Brick Company to membership.

Plans have been prepared at Nashville, Tenn., by Harry J. Frahn, architect for the remodeling of the three-story brick building at 212-214 Eighth avenue, north, owned by R. M. Bates and formerly occupied by the N. C. & St. L. Railroad offices.

Fulcher Brick Company, of Nashville, furnished the brick for the new home of the Fourth and First National Bank at Nashville, Tenn., which was occupied in January. It stands seven stories and is an architectural gem. One hundred and twenty-five offices are on the upper floors. Foster & Creighton were the general contractors. The cost of the job was about $600,000.

THREE OF A KIND.

The accompanying illustration is a reproduction of a postcard which came from "Somewhere in Texas" bearing a message of best wishes for a happy and prosperous New Year from Col. Robert L. Queisser and his two sons, First Lieut. Charles F. Queisser and Second Lieut. R. L. Queisser, Jr. It is an unusual group, and one which many readers of The Clay-Worker will observe with pleased interest, for Queisser, Sr., is one of the popular brick boosters. He served the face brick industry well and faithfully, just as he is now serving his country.

Colonel R. L. Queisser and His Two Sons in Regimentals.

BUFF BRICK WANTED.

Editor The Clay-Worker:

Enclosed find check covering charge for For Sale ad in The Clay-Worker. Wish you would put us in touch with parties, preferably in this section, who are making a good buff brick. Would like to get sample and prices f. o. b. cars Hamburg, at once.

Yours very truly,

Tobias & Sheridan.

Hamburg, Pa.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Has Been a Reader of Clay-Worker Twenty-eight Years.

Editor The Clay-Worker:

I am pleased to enclose my check for subscription for 1917. This is my twenty-eighth renewal, and I have always appreciated The Clay-Worker. Would be at a loss to get along without it, for it gets better every year.

Yours very truly,
Clarksville, Tenn. W. A. SETTLE.

Who Invented the First Sewer Pipe Press.

Editor The Clay-Worker:

I would like to have you tell me, if you can, where the first sewer pipe was made, and who was the inventor of the steam pipe press and also of the terra cotta hollow building block. I have spent about thirty-five years in the sewer pipe business, beginning back in 1851 in England.

JAMES WOODS.

Who Can Give the Answer?

Editor The Clay-Worker:

We are looking for a barrow wheel of the following dimensions: Diameter, 30 inches; tire, 2x⅜ inches; hub, 6 inches with 1¼-inch bore. This is a rather unusual size and, although we have purchased wheels of this size before, we have lost the address of the company from which we purchased them.

We will appreciate it very much if you can ascertain for us where wheels of this dimension may be obtained.

Yours very truly,
CENTERVILLE BRICK CO.
Iowa.

A Great Work for the Paving Brick Men in California.

Editor The Clay-Worker:

Last fall the state of California voted $15,000,000 for the paving of country roads, in addition to the $18,000,000 which had previously been expended for paving roads, which was done with concrete and asphalt, all of which has been very unsatisfactory and very expensive to keep in repair so as to be in a passable condition. If some man who thoroughly understood the building of brick paved roads would come out here to California he would soon have more business than he could do, and also be a public benefactor, and one that would be much appreciated by the people generally.

Yours truly,
California. J. ALBERT FERBACHE.

An Optimistic Brickmaker.

Dear Mr. Randall:

We are glad to tell you that everything looks pretty good for a good year with us, and I am mighty glad to know from your recent letter that the outlook with you is good, notwithstanding judging from your little poem, "Cheer Up," in November issue, you were disappointed in the election. Judge many others of the East were disappointed, too, but don't take it too hard, for the next four years will soon roll around and you will have another chance to even up the score. Just enjoy this good prosperity while we have it, because when we have a change of administration, it may not be so good. With kindest regards and best wishes, I am,

Yours very truly,
Buffville, Kans. B. W. BALLOU.

Brick Men of Eastern Pennsylvania Organize.

Editor The Clay-Worker:

At a meeting of the red face brick manufacturers of the eastern part of Pennsylvania, held at Sunbury, December 13, an association was organized to be known as the Eastern Pennsylvania Brickmakers' Association. The object of this association is very much the same as that of the parent organization, the N. B. M. A., with the difference that it will go after questions and problems affecting the members only, but of course co-operating with any affiliated interests. J. C. Fowler, of the Paxton Brick Company, at Middleburg, is president; Walter Parsons, of the Keystone Brick Company, of Watsontown, is secretary and treasurer.

J. P. WILLIAMS.

Wyoming Prosperity.

Dear Mr. Randall:

I send you herewith a draft to cover my subscription to The Clay-Worker for 1917, and to pay my membership fee in the National Association. We have had a fairly busy and prosperous season, but even so, I am afraid I will not be able to meet you in New York this winter, as I would like to do, because the distance is too great and the time lost too much. You may smile at this statement, but if you were familiar with all the conditions of brickmaking in this state you would wonder that we can keep up our membership and send in subscriptions for a clay magazine.

I have been operating two dry press plants this last year at full capacity and am short on stock, and the prospects for the coming year make me wonder how I can supply the demand. Am preparing to enlarge my plant at Casper, and am also preparing to put in a new plant at Big Horn Basin, to make drain tile and hollow ware. Wish you would find me a man to come out here and take charge of such a plant. We have electric power and burn with natural gas, and have a ready market for all the ware we can produce. I would prefer a man with some capital to invest.

Casper, Wyo. CHARLES GALUSHA.

New England Jottings.

Editor The Clay-Worker:

The new year opened with bright prospects for brickmakers generally in this section.

The Claremont Brick Company, of West Claremont, N. H., has been incorporated by Charles V., Allen E. and I. M. Paddock. The company has good brickyard property, with all natural advantages, including hugh clay bank, good sand, railroad track and electric feed wire through the property. They will make sand-struck brick, and all machinery has been purchased from the Eastern Brick Machinery Company, of New Haven, Conn. A 75-hosepower Westinghouse motor will be installed. The yard also has the advantage of being situated midway between Windsor, Vt., and Claremont, both of which are very thrifty towns.

C. C. Dyer, of Greenfield, Mass., has made a number of improvements at his plant, including the installation of a Thew steam shovel.

Harrison E. Doty, for a number of years associated with the Fitchburg Brick Company, Fitchburg, Mass., has resigned to become manager of the Berlin Brick Company, Berlin, Conn.

Daniel O'Connel, one of the pioneer brick manufacturers of New England, died at his home in Holyoke, Mass., in December, in his eighty-fourth year. Mr. O'Connel had been in the brick manufacturing and contracting business, and retired from active business a number of years since, and the business is now being run by his sons, under the old firm name of Daniel O'Connel's Sons. There are four sons, all practical business men.

Another well-known brickmaker who has passed away since my last letter is William E. Davis, president and senior member of the firm of William E. Davis & Co., of New Haven, Conn. His death occurred January 5. He leaves a daughter and two sons, William E., Jr., and Harold M., who will continue the business.

NUTMEG.

SECOND NATIONAL COMPLETE BUILDING SHOW

A RARE OPPORTUNITY TO DEMONSTRATE THE SUPERIORITY OF BRICK OVER ALL OTHER BUILDING MATERIALS

READERS OF THE CLAY-WORKER are aware that a great exposition of building materials is to be staged at the Grand Central Palace in New York City, March 5 to 11, 1917, for the preliminary announcements have been given prominence in recent issues. Whether they appreciate the importance of the Show as a means of promoting a greater use for building brick seems somewhat problematical. To make the Show effective in a large way, brickmakers themselves must take an active interest in it and co-operate with the exposition officials in an effective way. In order to secure this team work, Mr. Robert Mitchell, in whose fertile brain the show idea originated, has circularized the brickmakers of the country, prefacing his communication with the startling caption—"IS THE CLAY INDUSTRY DEAD OR ALIVE?"

From the replies to this communication it would seem that the query is answered in the affirmative, and that a brick show will be given that will surpass in general excellent, any previous attempt in this direction. Any of our readers who have not received the communication mentioned and desire information in regard to the show are requested to communicate direct with Mr. Ralph P. Stoddard, Secretary, Leader-News Building, Cleveland, Ohio.

The Aims and Purposes of the Show.

Educational in every feature, the Second National Complete Building Exposition will be by far the most ambitious demonstration of up-to-date building, equipment and furnishing ever attempted in the United States. It will be backed by the best expert knowledge of the country and will exert a strong appeal to every man who is a prospective builder. Boiled down, the exposition will be a great big compelling argument for better building of whatever character.

This exposition will be but a furtherance of the movement for better building, which was initiated in the First American Complete Building Show, held in Cleveland, last February. The effect of the Cleveland show has been felt emphatically the past season throughout the Middle West and particularly Ohio from which the greater percentage of the attendance came. In that territory building in general the past summer was of higher class than ever before; higher grade materials and more modern equipment were used and the gross investment was greater than in any preceding year.

New York being the center of the great building interest of the East and enjoying a constant transient population far in excess of any other American city, it is confidently expected that the influence of this exposition will be felt not only throughout the East, but nationally. That it will materially effect the building in the Eastern territory for several years to come is a conclusion safely based upon the very gratifying results of the Cleveland show. And that the exposition is to be held right on the eve of the opening of the spring building season is but an additional asset for all material manufacturers who participate.

The Building Show to Be Educational.

Expanding beyond a mere exhibition of all kinds of building materials and equipment, the exposition will provide instructive demonstrations of construction methods, architecture, engineering, landscaping and garden furnishment. Special divisions will be devoted to factory, commercial and general building; there will be separate displays of theatre, church and school building equipment, and the home building interest will be maintained with equal strength. In these exhibits will be especially emphasized the possibilities for beauty, safety, convenience, comfort and general utility.

Negotiations are on with several associations advancing the interests of brick, tile, terra cotta, cement, metal lath, and gypsum products looking to community exhibits demonstrating their respective materials. Many concerns representing heating, lighting, safety devices and building materials have taken space. There will be a special machinery division and lumber will be represented by exhibits from six of the leading lumber associations of the country. Approximately fifteen per cent of the space has been sold.

A representative attendance is assured. Being something distinctly new for New York, the exposition is expected to develop a keen local interest, by far exceeding that expressed in the ordinary trade exposition. The interest of the architects of the country will be enlisted through a novel competition for home designs. Trade conventions, representing brick, tile, clayworking interests in general, and the building supply dealers of New York state, will bring thousands of delegates to the city during the show week. And New York's big transient population will represent the entire country. It is expected that at least two floors of the Grand Central Palace, which is within trolley ride of 7,000,000 people, will be utilized.

See ads on pages 97 and 102 of this magazine.

OCEAN-GOING STEAMSHIPS BEING BUILT AT SLIDELL, LA.

AN EPOCH-MAKING event recently occurred at Slidell, La., when a large freighter, built by the Slidell Ship Building Company, another of the big enterprises of the Salmens, was launched with appropriate ceremonies. Two hundred or more of the representative merchants of New Orleans, chaperoned by Mayor Behrman, went to Slidell on a special train to participate in the celebration which promises to make that town, heretofore celebrated chiefly because of the immense brickyard, one of the great industrial centers of the South, for it is proposed to build great steel steamships as well as wooden freighters.

The first ocean freighter was christened the Baltic the First, and is the largest ship ever built in America south of Newport News. She is 230 feet in length and 44 feet beam. She will carry a cargo of 2,000 tons, and as built is especially adapted to the lumber trade. Three other ships of the same type, Baltic II, Baltic III and Baltic IV, are in course of construction. These ships when completed will leave Slidell fully equipped, manned and ready for sea, and will probably be used chiefly in freighting cargoes from the Gulf Coast to European ports. Mr. Fritz Salmen, first vice-president of the N. B. M. A., and his son, Fred Salmen, are the prime movers in this great enterprise.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-THIRD YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to
226 East Ohio St. T, A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVII. JANUARY, 1917. No. 1.

CURRENT COMMENT.

You have a date on Broadway, March 5-10, 1917.

* * *

Are you in harmony with that idea of live and help live as a 1917 working model?

* * *

Do not overlook the opportunity that great home show offers for showing off brick.

* * *

The farm field is mighty big in possibilities for extending the use of clay products. Keep cultivating it.

* * *

Take an idea with you when you go to the convention and it will help get more ideas to take back home with you.

* * *

The worst features about the fellow who does business without a profit is that he does harm to others as well as to himself.

* * *

There will be doings when a full kennel of that Ancient Order of Yellow Dogs gets turned loose along the Great White Way.

* * *

Shape your affairs so as to be at the big doings in the big town of New York, March 5-10. Let us make it the greatest of all the big N. B. M. A. conventions ever held.

* * *

Enterprising real estate men are now good boosters for brick because they realize that it adds a lot more to the selling value of a house than it costs.

* * *

The indications are that there will naturally be much more building done this year than was done last year which will add some to the volume of brick consumption regardless of efforts at exploitation, but the business of the brick trade should be to add still more to the volume by so exploiting that more than the usual percentage of houses built will be built of brick.

* * *

Get your plants overhauled and your new machine in early so as to be ready for the rush, for it looks like it's coming.

* * *

Those farm loan banks should help put many a farmer in shape to build a new brick home. Get them inspired with the idea.

* * *

The new leaf looks mighty bright and now let's all help keep it that way and try to make 1917 a record breaker in good things.

* * *

It is the problems of life which add zest to work, but sometimes they pile up so many burdens that zest gets snowed under for a while.

* * *

The coal item has been looking up in a way to make the average man more zealous about looking for appliances and methods to help economize in fuel.

* * *

The cement production for 1916 is estimated to be 5,000,000 barrels greater than 1915. The shipments made during the year are said to aggregate 94,500,000 barrels.

* * *

Since we now have more money in this country than there is in any other country, and more than was ever known before, it ought to be a good time to pay and be paid.

* * *

The past year was the greatest on record in the matter of bonuses paid to employes, and voluntary wage increases, which makes an inspiring sign of good times and a good order of thoughtfulness.

THE LAST WORD ON COSTS.

There has been so much said about cost keeping and correct cost accounting that the subject has been worn more or less threadbare, and people are beginning to grow a little bit weary. Protests are being heard that the subject is tiresome.

There is a last word to say, however, and that last word is uniform costs. We are realizing now that it is a matter of importance to each branch of the trade to follow in the main essentials some uniform system, that is, to uniform their methods so as to include the same essential items. This is important as preventing confusion and leading to clear, mutual understandings.

So let us get busy and uniform the methods of cost accounting in the industry, then make this a sort of last word on the subject and then quit talking about it.

LITTLE OL' NEW YORK.

Little ol' New York, where every man in the clay products industry has a date with the N. B. M. A. and the allied associations, also with the Complete Building Show, for the week of March 5 to 10, with headquarters at the McAlpin Hotel, is some town any way you take it.

It is not only big in population, finance, commerce and international shipping, and not only does it have sky-scrapers and big business buildings, but it also does something in the way of residence building.

The record for 1916 shows that there were 11,650 dwellings built during the year, to accommodate 115,000 persons, at a cost of $32,610,000.

We have been told by the henchmen of old Father Knickerbocker that he has his latchstring hanging outside the door and has a tag on it labeled Build With Brick.

Let us all go and see about that, attend convention sessions, see the Show and see to it that through the Show and the efforts of the brick men Father Knickerbocker is properly impressed that henceforth when he goes to build anything in the form of a dwelling, from a cottage to a mansion, the one best bet is to Build With Brick.

GERMAN PORCELAIN PRICES INCREASING.

There is some encouraging news comes from abroad for those who perhaps may be fearing the dumping of German pottery products in this country after the close of the war. The news tells of increases in prices there, which seem to be necessary, just as increased prices are necessary here. Consul Harry C. Seltzer reports from Breslay that most of the prominent porcelain manufacturers in Germany have agreed upon a further increase of 20 per cent. on the prices of their product, that is, from a previous increase of 45 per cent. to 65 per cent. over the prices prevailing before the war. It would seem that the necessity for higher prices in Germany would in itself prove one safeguard against dumping in this country at prices which might prove ruinous to domestic manufacturers.

LOCAL ORGANIZATION.

Plenty of evidence has been piling up lately that local organization is plainly a factor of magnitude in every branch of the clayworking business. Manufacturers of face brick, many of whom expressed themselves at the recent meeting on this subject, are pretty well agreed that local organization contains much of the secret of success in business. The brick dealers, too, in expressing their views, almost unanimously accepted the idea that local organization is the keynote to harmony and profits. It is the same in the manufacture of common brick, and in fact, in industry everywhere. It takes local organization to solve the local problems and to work out details and promote understandings that are essential to the right order of co-operation. So, while considering all subjects in their broader aspects in the bigger associations, let us not forget the importance of local organization as a factor in business enterprise, which can also be made a contributing factor to success in the larger organizations.

CONVENTION ATTENDANCE.

That attending conventions is a good thing and makes its appeal to the enterprising business man, is substantially attested by the fact that during the winter season every business man attends one or more conventions in his line. To many, however, there seems to be a disposition to attend upon convention meetings without attending convention sessions. Those who follow this idea perhaps enjoy life, but they also miss something. There is really a point of distinction between attending a convention and attending the various convention sessions, and it is time we pay more attention to this point. The complatint of association officials everywhere is that not enough of those attending conventions stay in the sessions. To get the full measure of benefit one should stay in practically all the sessions because there is more to be had from listening to and participating in discussions than in reading the results afterward. Therefore, we should have what might be termed a better spirit of co-operation between officers and delegates to the end that conventions may be more fruitful of specific results as well as beneficial in a general way and enjoyable to everybody. The programs may have to be changed and the sessions shortened and the formal papers printed in advance and the meetings given over to discussions rather than reading papers, so as to make the sessions more attractive. On the other hand, the sessions can be made more attractive and worth while by the delegates attending conventions, making up their minds that they are going to participate in the sessions, and planning to so divide their time that they can see the sights antd be active in convention work, too. This is the real way to get the full measure of results out of attending conventions.

MOVE TOWARD TRADE ACCEPTANCES.

What is known as the bank acceptance or trade acceptance idea in lieu of open accounts, is persistently asking for attention. It is a good idea, too, for us to keep this in mind and move toward it.

It seems like a radical departure from the open account system and there are difficulties easily discernible in the way of individuals arbitrarily putting the idea into operation because it would immediately result in friction between the seller and his customers.

The idea is sound fundamentally, however, and is much better than the spot cash idea which has often been advocated. We are becoming enough of a financial power in the world that the future will see a much wider extension of credits than we have had heretofore. The sensible plan to carry out in connection with them, however, is to make these credits specific by putting them in the form of trade acceptances instead of carrying them as open accounts.

So, whenever you feel like making a move to revise your trade terms on this point, try getting together with the other fellows and talking it over with a view to moving toward trade acceptances, in the place of open accounts.

FARM LOANS AND CLAY PRODUCTS.

Are you keeping up with what is doing in the way of developing the farm loan bank idea and making plans to see that this contributes materially to prosperity in the clay products industry? If not, you are overlooking something, because the farm loan bank idea is a big thing. In the opinion of the President and of many other thoughtful students, it is the next biggest thing in the financial world of this country to the Federal Reserve banks themselves. So there seems no question about it being a big thing generally, and an especially good thing for farmers who need capital to improve their land and carry on their work. Whether or not it is a big thing for the clayworking industry will depend materially upon the activities of the members of the trade themselves.

There is nothing of more importance in the improvement of farming communities than the building of good permanent brick buildings. With capital made available in the shape of long time loans at low interest rates, there should be a natural disposition on the part of farmers to build permanently, to take their time and put up structures that will be a monument to themselves as well as a good investment, which means brick buildings.

Many farmers will think of this themselves, but many more can be made to think of it by the right kind of active boosting of clay products and that is what it is up to the clayworking industry to do if they would profit as they should. There is not only the farm home, but many other farm buildings; in fact, the farm field has great possibilities in the way of developing a wider use of burned clay products in building operations.

Then there is the drain tile proposition. This subject has been agitated enough that many farmers are duly impressed with the importance and the benefit to be derived from drainage. Many who have been so impressed have hesitated to undertake this work for the lack of capital. Now there will be capital available, and the making of this capital available through farm loan banks should create a great opportunity for the boosters of drain tile.

In fact, taking it all around, there is a chance for a lot of good work in practically every line of clay products that can be made use of on the farm, and active exploitation is a factor that will count big in the present instance. Other people are well advised of the possibilities of getting a share of trade out of this farm loan proposition. The lumber people are getting into the game, the furniture people, local merchants and the auto and truck people. So there is going to be quite a race for a share of trade this new source of capital will open up. If the clayworkers want their share they should go after it.

SOUVENIRS AND CALENDARS FOR 1917.

For reasons not hard to discern, the calendar crop this year has fallen way below the average. As a result we are shy quite a number of pleasing wall decorations, to which we have been accustomed in years gone by. This we must attribute, presumably, to the high cost of living, or to be more specific, the high cost of paper. Nevertheless, we have received a number of very attractive calendars and souvenirs.

The first to come to hand was that of the Salmen Brick and Lumber Company, Slidell, La. It is of the poster type, being 20x28 inches in size. It bears the firm name in large type and shows a general view of the immense brick and lumber plant at Slidell. Its size makes it especially adapted to factory use.

A similar calendar bears the name of J. C. Steele & Sons, clay machinery manufacturers, Statesville, N. C. This, too, shows a view of the factory. An unusual feature is a weather forecast on the bottom of each calendar pad, giving the weather prognostications for the month, as reported by the Weather Bureau for the various sections of the country.

George H. Clippert & Bro. Brick Company, Detroit, Mich., favored us with a poster calendar, but more picturesque and decorative in character. The upper portion is a reproduction of a noted picture, entitled "All Is Well," being a marine view picturing a great ocean liner under the searchlight of a friendly battleship.

The Suffolk Clay Company, Suffolk, Va., has one of the most beautiful calendars of the year, a medallion-like portrait of a very beautiful lady. The calendar pad is small, making it best suited for home consumption.

The offering of the Tuttle Brick Company, Middletown, Conn., is also of the poster type, showing a birdseye view of their immense building brick plant, one of the leading brickmaking establishments of New England.

Clippert, Spaulding & Co., Lansing, Mich., have a calendar of unique design, which is illustrated with photos of the products of their plants, in natural colors, including common brick, hollow building block and drain tile. It also bears the portraits of George C. Clippert and O. E. Spaulding, while in the center is a view of the Michigan State House, over which is printed the announcement, "The same men, the same firm and the same reputation for square dealing, which stood behind the 15,750,000 brick put in the Michigan State Capitol in 1872, stand behind the brick you buy today from Clippert, Spaulding & Co." All in all, it is a very effective piece of advertising.

The daintiest in decorative scheme and color work bears the imprint of the Reynoldsville Brick and Tile Company, Reynoldsville, Pa. It bears the inscription, "May each day of the New Year be for you and yours, a harvest day of happiness and success."

The holiday season brought us innumerable Christmas and New Year cards, bearing the best wishes of friends from all sections of our own country and a few from foreign countries, each and all of which were gratefully appreciated.

The Bonnot Company, Canton, Ohio, manufacturers of clayworking and cement machinery, favored us with a very acceptable memorandum book which is a compendium of information of a general sort.

We are indebted to the Brick, Terra Cotta and Tile Company, of Corning, N. Y., of which M. E. Gregory is president, for a very useful souvenir in the form of a match holder and ash tray, a product of their terra cotta department.

A. C. Ochs Brick and Tile Company, Springfield, Minn., sent a New Year's greeting with a calendar and memoranda pad, for desk use, which is an admirable combination for either office or domestic use.

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FOR SALE CHEAP.

One Bensing automatic tile cutting table and one board delivery brick table. Both in good condition. Not much worn. Bargain. Address,

JOHN PINES,
Stuart, Iowa.

1 1 cm

FINE BUSINESS OPPORTUNITY.

Wanted a man with some capital to take charge of a plant doing a fine business. Have electric power and gas for burning, and a ready market for all we can produce. Have more business than we can handle. Address,

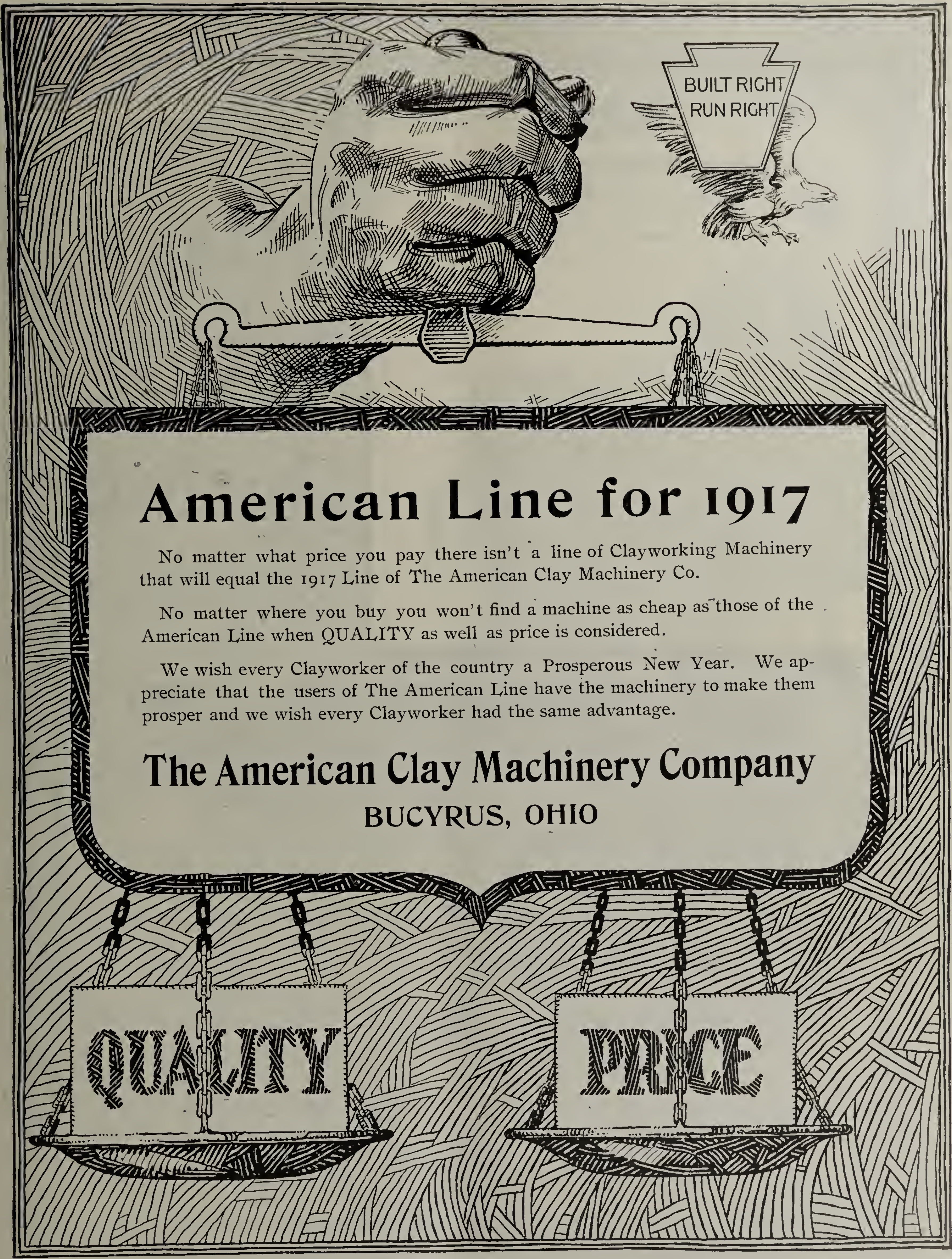
CASPER,
Care Clay-Worker.

1 1 d

IRA M. JONES
Patent Attorney
Patent and Trade-Mark Causes
Washington Loan & Trust Building
WASHINGTON, D. C.

Mention the Clay-Worker
When Writing to Advertisers
Mention the Clay-Worker

We Build Every Appliance and Machine Needed by Clayworkers.



American Line for 1917

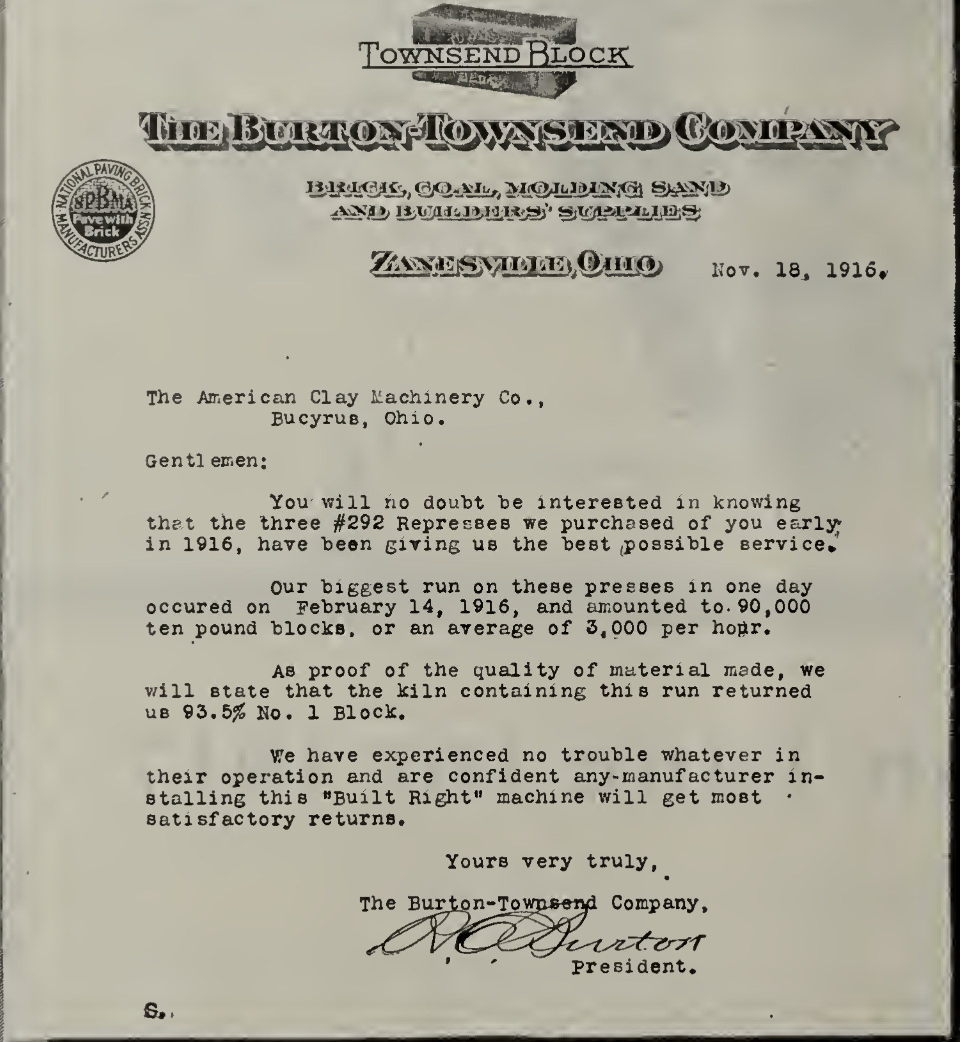
No matter what price you pay there isn't a line of Clayworking Machinery that will equal the 1917 Line of The American Clay Machinery Co.

No matter where you buy you won't find a machine as cheap as those of the American Line when QUALITY as well as price is considered.

We wish every Clayworker of the country a Prosperous New Year. We appreciate that the users of The American Line have the machinery to make them prosper and we wish every Clayworker had the same advantage.

The American Clay Machinery Company
BUCYRUS, OHIO

A Quality in Clayworking Machinery Above All Others.



TOWNSEND BLOCK

THE BURTON-TOWNSEND COMPANY
BRICK, COAL, MOLDING SAND
AND BUILDERS' SUPPLIES
ZANESVILLE, OHIO

Nov. 18, 1916.

The American Clay Machinery Co.,
Bucyrus, Ohio.

Gentlemen:

You will no doubt be interested in knowing that the three #292 Represses we purchased of you early in 1916, have been giving us the best possible service.

Our biggest run on these presses in one day occured on February 14, 1916, and amounted to 90,000 ten pound blocks, or an average of 3,000 per hour.

As proof of the quality of material made, we will state that the kiln containing this run returned us 93.5% No. 1 Block.

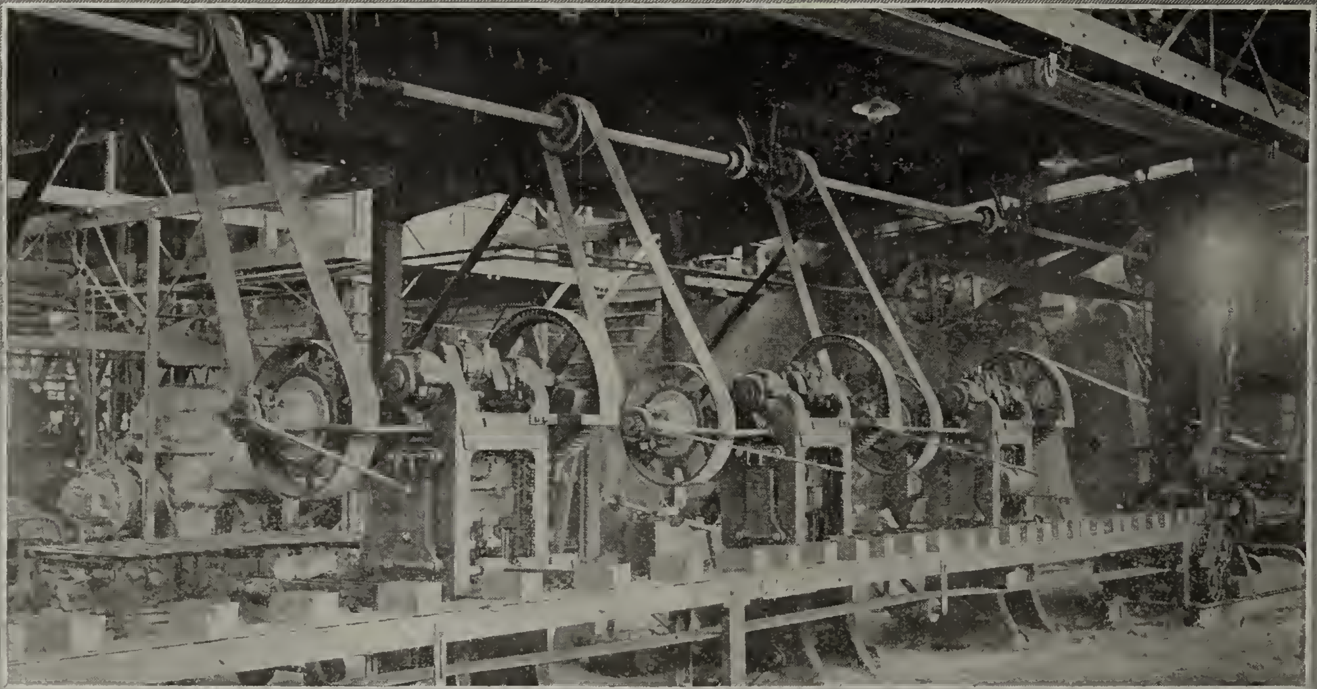
We have experienced no trouble whatever in their operation and are confident any-manufacturer installing this "Built Right" machine will get most satisfactory returns.

Yours very truly,
The Burton-Townsend Company,
R. C. Burton
President.

S.

Large Runs and 93.5% Quality

Built Right
Run Right



OUR ENGINEERING DEPT. IS AT YOUR SERVICE

THE AMERICAN CLAY MACHINERY CO.

BUCYRUS, O., U.S.A.

Ask for One of Our American Flag Bows Free. A New Novelty.

The AMERICAN CLAY MACHINERY COMPANY
The Haigh Continuous Kiln
BUCYRUS OHIO
BUILT RIGHT RUN RIGHT

Can You Beat It?

On the preceding page is a letter from a user of the American No. 292 Repress.

Thirty thousand ten pound pavers a day and no mechanical trouble.

And besides this big output, and no repairs in nearly a year, they get 93 percent No. 1 Block from the kiln.

Deducting block that are defective from causes other than repressing and you get PERFECTION in Presses.

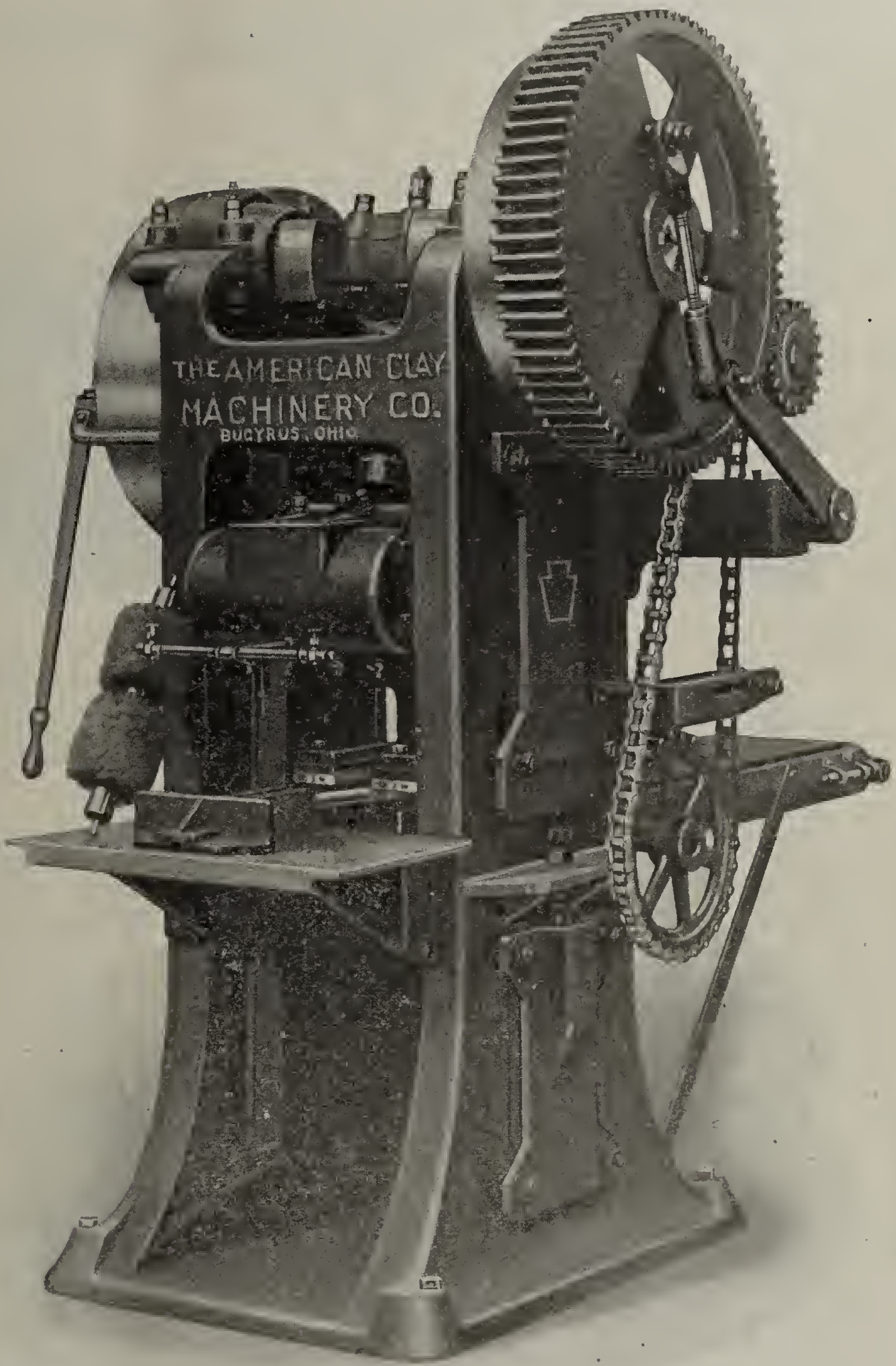
These American No. 292 Represses were sold to the Burton-Townsend Co., only after their most rigid inspection and investigation. The No. 292 Repress stood this investigation and made good because:

It is well designed.
It is mechanically correct.
It is built of high quality material.
It is built by high class mechanics.

The American No. 292 Repress is easily the best press on the market regardless of price and is the cheapest press to buy provided you want to keep your press running and want capacity without delays.

SEND FOR
SPECIFICATION SHEET

We Build a full line of Clayworking Machinery, all of best quality.



The American Clay Machinery Co.

Bucyrus, Ohio.

World's Largest Manufacturers of Clayworking Machinery.

Much the Largest Manufacturers of Clayworking Machinery in the World.

The AMERICAN CLAY MACHINERY COMPANY
BUCYRUS, OHIO
The Haigh Continuous Kiln

BUILT RIGHT RUN RIGHT

Is Coal Worth Saving?

Here is a plant burning ten pound Paving Block with 1,200 pounds of coal to each 1,000 block. On other kilns it would require from 2,000 to 2,500 pounds of coal per 1,000 block.

The saving of coal is due to the use of the HAIGH CONTINUOUS KILN and the saving does'nt stop at a saving in coal, because the HAIGH KILN also saves at least a half of the labor cost.

The HAIGH KILN will make just as big a per cent of saving for you as it does for these people. The installation of the HAIGH KILN will pay for itself in the first few years. It is flexible, making it possible to put in a few units now and letting those units pay for themselves and the further extensions needed.

And then too the HAIGH KILN produces the highest per cent of No. 1 pavers and building brick of any kiln built.

Get the "HAIGH HABIT" and your profits will increase because of the saving effected, the increased quality of your brick and the high per cent of No. 1 product.

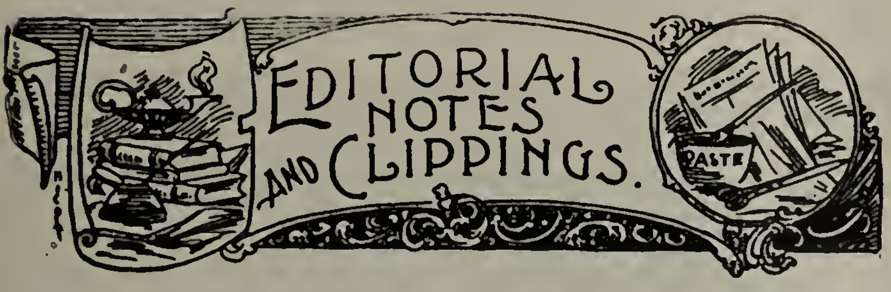
Send for photos and description of the HAIGH KILN. We build every machine and appliance for the Clayworker.

The American Clay Machinery Co.

BUCYRUS, OHIO.

The Highest Quality of Clayworking Machinery.

EDITORIAL NOTES AND CLIPPINGS



W. W. Lewis and associates will build a $40,000 brickmaking plant at North Baltimore, Ohio.

The Hammond Brick Company, of Hammond, La., sustained quite a serious loss when fire destroyed the dry kiln.

The property of the Alexander A. Scott Brick Company at Knoxville, Tenn., has been sold to the Kingston Pike Brick Company.

P. M. Crane, of Mercer, Ky., writes that he is in the market for flower pot machinery and would like to receive catalogues and prices, and information as to testing clays.

The Hoosier Clay Products Company has been incorporated with $225,000 to manufacture and sell clay products. Those interested are D. S. Strong, W. E. McKee and R. W. Sutton, of Hillsdale, Ind.

It is announced that W. J. Gilbert, of the Gilbert Clay Manufacturing Company, Chicago, Ill., has under plans the erection of a factory at Wellsville, Mo., for the manufacture of fire brick.

The Success Brick, Tile and Stone Company, of Tulsa, Okla., has been incorporated. A. C. Brown, of Sapulpa; J. R. Vinsant, Oklahoma City, and J. Q. Bennett, of Independence, Mo., are interested.

B. A. Schneider, proprietor of the Laurel Brick Works, Laurel, Miss., advises us that he wants to purchase a sand-lime brick outfit, and would prefer a second-hand equipment, provided it is in first-class condition.

Charles L. Kelley, for many years engaged in the brick industry in Chatham, N. J., died at his home in that city December 31. Mr. Kelley was seventy-eight years old. His widow, three daughters and three sons survive.

Herbert L. Fiske, for a number of years secretary of the Chamber of Commerce of Worcester, Mass., has resigned to engage in the manufacture of brick at West Brimfield, Mass. The name of the new concern will be the Brimfield Brick Company.

Charles Nelson, a laborer, was burned to death when the engine room of the Illinois Brick Company's plant at Calumet, Ill., was destroyed by fire recently. He had been allowed the privilege of sleeping in the building, as he seemed to have no other home.

The A. P. Green Fire Brick Company, Mexico, Mo., has nearly doubled its capacity, and in another month or two will have twenty-two modern kilns under fire. This company had a very busy year in 1916, and the prospects are that the coming year's business will surpass that of last year.

Fire recently destroyed the boiler room, machinery room and dryer house and damaged other buildings at the plant of the Des Moines Clay Company, Des Moines, Iowa. The fire started in the engine room and burned for three hours before the firemen had it under control. The plant will be rebuilt at once.

The capacity of the Alsey Brick and Tile Company, of Alsey, Ill., will be increased from 20,000 to 40,000 brick per day, which will make necessary the erection of a new drying room, four additional kilns and the installation of another press. The company recently erected twelve brick cottages for its employes and will erect twelve more the coming summer.

A new corporation has just been formed at Grinnell, Iowa, and named Grinnell Clay Products Company, which takes over the property of the old brick and tile company, with an authorized capital of $50,000 and a lease of twenty years, subject to previous renewal. The present board of directors is made up of V. F. Vogt, T. J. Bray, C. A. Smith, Paul Essler, R. G. Coutis, Grant Ramsey, H. W. Spaulding and J. P. Lyman.

The employes of the Chicago Retort and Fire Brick Company's plant at Ottawa, Ill., were given a holiday gift worth while when the company announced that the workmen at the plant would in the future receive ten hours' pay for nine hours' work, while the office employes get an increase of 10 per cent. in salaries, and as an additional gift 5 per cent. of the amount of their salaries during the past year.

Irving Matthews, of Hoquiam, Wash., writes that he would like to get in touch with manufacturers of clayworking machinery.

C. G. McLees and Henry Von Ohsen, Jr., have just organized the Orangeburg Brick Company at Orangeburg, S. C., and will erect a plant of 40,000 daily capacity at once.

A company is being organized at Port Arthur, Texas, to erect a large brickmaking plant at that place. Warren McDaniel, a local contractor, is at the head of the concern.

Charles Taylor, engineer at the Western Brick Company's plant, Danville, Ill., was found dead beside his engine the morning of January 15. It is presumed he met with foul play.

The Providence Brick Company has filed articles of incorporation with $20,000 capital stock. Frank E. King, Robert H. Matthews and Wm. F. Leonard, all of Providence, R. I., are interested.

Burglars broke into the office of the American Clay Products Company near New Brunswick, N. J., blew the safe open with dynamite and escaped with $600 in cash. The watchman heard no sound from the explosion.

A charter has been filed for the Consolidated Mineral Company, of North East, Md., to manufacture and deal in clay and other minerals. G. K. Hack, James Russell, Frank Russell and Edwin Russell are the incorporators. The capital is $2,000,000.

The Arkansas Brick and Tile Company has purchased from T. N. Atchinson his brick plant at Perla and fifty-eight acres of clay land for $20,000. The two plants will be merged and many improvements will be made in both. Mr. Atchinson will continue to manage the plant at Perla.

We are advised that a new concern has been organized at Kittanning, Pa., to manufacture brick, tile and fire-proofing, and will operate under the name of the Kittanning Ceramics Company. The buildings are now being erected, and it is expected the plant will be ready for operation early the coming summer. Mr. H. L. McNees, who for a number of years has been associated with the Kittanning Clay Manufacturing Company, will be general manager.

W. C. Stevens, a pioneer in the manufacture of clay wares in the South and head of the Stevens Pottery Company, of Stevens Pottery, Ga., died at his home in Macon, Ga., December 14. Mr. Stevens was seventy-one years old, and had lived in the immediate vicinity of Macon all of his life. His wife and two daughters survive. Mr. Stevens had been connected with a number of large business interests, but had recently retired from active connection with everything but the pottery. He was widely known for his large gifts to charity.

In order to aid their employes to meet the high cost of living and yet not give an increase in wages, which later on, when conditions are again normal, it would be difficult to reduce, the Onondaga Pottery Company, of Syracuse, N. Y., adopted the plan of giving bonuses of $5.00 a month to the men and $3.00 a month to the women. As there are 700 employes at the pottery, this bonus system means quite an increase in the company's pay roll. One stipulation is that to be eligible to receive the bonus an employe must work at least five days a week.

The Chicago Retort and Fire Brick Company, Chicago, Ill., has leased an immense tract of land near Morris, Ill., on which they will start the erection of one of the largest fire brick plants ever built early in the spring. The company is now mining clay on the site, which is being shipped to their plant at Ottawa. The site which contains 480 acres was once covered by a body of water known as Goose Lakes, which was drained into the Kankakee river by means of 27-inch tile, and it was while making the excavations for the tile that the clay was discovered, which it is said varies from thirty to fifty feet in thickness.

Delatte & Lagrange have leased the plant of the H. E. Buck Brick Company at Lake Charles, La., for a term of years, and will operate the same in connection with their present plant. The lease runs for a term of years, Mr. Buck having decided to look after his other business interests and dispose of the brick plant. Adolph Lagrange will manage the present brick manufacturing plant owned by Delatte & Lagrange, while A. Delatte will be in charge at the Buck brickyard. Delatte & Legrange becomes one of the largest brick manufacturers in that section by means of the deal just completed. They ship brick to all parts of Louisiana and Texas, and with the Buck plant will have a yearly output of 10,000,000 brick.

Charles C. Cumings, of Cloverdale, Ind., is in the market for some second-hand tile dies from 5-inch up to 8-inch.

The Phillipsburg Clay Products Company is preparing to erect an up-to-date brickmaking plant at Phillipsburg, Pa.

Baxter Genoble, of Pacelot, S. C., contemplates establishing a building brick plant of 30,000 daily capacity, at Greenville, S. C.

The St. Clair Brick Company, of St. Clair, Mich., will increase its capacity to 20,000,000 brick per year, and is selling shares of stock to raise the money to purchase new machinery.

The San Francisco Clay Corporation, of San Francisco, has been incorporated to manufacture fire brick, sewer pipe and other clay products. The company will be incorporated at $85,000.

Cambridge Brick Company, of Cambridge, Ohio, has been incorporated at $10,000. Incorporators are: H. C. Callihan, Harry Bell, Charles F. Baughman, Frank E. Bottlemire and Clarence H. Stemm.

The Ajax Clay Works has been incorporated at Macon, Ga., with $100,000 capital stock, to manufacture silo blocks, segment sewer block and fire brick. R. E. Findlay and G. W. Matthews are interested. The plant will be equipped with machinery from the shop of C. & A. Potts & Co., Indianapolis.

Fire of undetermined origin destroyed an electric motor and other machinery in a one-story frame building at the brick manufacturing plant of William Sankey & Son, South Twenty-first street, Pittsburgh, Pa., causing a loss estimated at $5,000. The building was destroyed.

The American Sewer Pipe Company has decided to rebuild the brick plant at Toronto, Ohio, which was destroyed by fire several weeks ago. The new structure will be of four stories and will cost $50,000. When completed the plant will employ about one hundred men. The latest machinery will be placed in the new plant.

William Deckard, one of the workmen of the Danville (Ill.) Brick Works, while working around the steam shovel, was hit on the top of the head by a rock which fell from the shale bank and so badly injured him that he died in a short time, although an operation was performed in the hope of saving his life.

Jotham Post, whose brick plant at Glen Head, Long Island, N. Y., was destroyed by fire recently, writes that he is very busy rebuilding the plant. He has placed an order with the Wellington Machinery Company for new brick machines, but is in the market for 5,000 34x10 pallets with cleats or legs on the end.

At a recent meeting of the stockholders of the Wheeling, Tile Co., Wheeling, W. Va., a resolution was adopted increasing the capital stock from $100,000 to $300,000. The purchase of the Labelle pottery, which has been closed for several years, was also authorized. The plant will be remodeled and porcelain ware will be manufactured there.

The Monmouth (Ore.) Brick and Tile Plant, which has been shut down for a year, will be started to work April 1. B. M. Partridge, of Dallas, has leased the plant from C. Lorence, administrator of the estate of G. F. Shew, the former owner. Mr. Shew's death last year caused the long shutdown of the plant. Mr. Partridge has been in the brick and tile business in Dallas, but will transfer his activities to Monmouth.

The Roodhouse Pottery Company, of Roodhouse, Ill., has been taken over by a new company and the plant has been overhauled and will be operating to full capacity again in a short time. The officers of the new company are: President, W. J. Chapman; vice president, J. B. Thompson; secretary, treasurer and general manager, J. H. Smith. Mr. Smith formerly lived in Jerseyville, but will make Roodhouse his permanent home.

The Hillview Brick and Tile Company will erect a brick and tile plant at Hillview, Ill., and work will be started as soon as the weather will permit. The company has opened an office at Jacksonville, Ill., which will be maintained after the plant is established at Hillview. According to the local papers, the clay has been tested and found satisfactory for making all kinds of clay ware, including pottery, floor tile, terra cotta and brick, but at present the company contemplates making only the better quality of brick which commands prices of from $40 to $100 per thousand. We wish the owners of this plant Godspeed in their work, and the realization of their fondest anticipations.

The Tom Green Brick Company, of Sioux City, Iowa, has increased its capital stock from $100,000 to $150,000.

A. Robinson & Son have taken over the interests of C. L. Graves in the Robinson-Graves sewer pipe factory, Uhrichsville, Ohio.

The Standard Brick Company, of Evansville, Ind., granted a 10 per cent. increase in wages to their employes, becoming effective January 1.

The employes of the McArthur Brick Co., McArthur, Ohio, were each presented with a ten-dollar gold piece as a Christmas gift. The payroll of the company includes one hundred employes.

E. J. Simpson writes that there is a good opening at Norman, Okla., for a brick and tile plant, and he would like to correspond with parties who are looking for a good location for a clayworking plant.

E. S. Hitchens, a well-known fire brick manufacturer, died at his home in Olive Hill, Ky., December 20. Mr. Hitchins was vice-president of the General Refractories Company, and had charge of the Olive Hill plant.

The new plant of the Wagner Fire Brick Company, of Pittsburg, Pa., which is located at Archbald, Pa., is rapidly nearing completion, and it is expected will be turning out their special process brick by the first of May.

The Hinde Brick and Tile Co., Sandusky, Ohio, employing sixty men, resumed operations on January 2, after being inactive for two months due to the acute coal situation. The company has enough fuel now on hand to insure operations during the rest of the winter.

The capacity of the Malvern Fire Clay Company's plant at Malvern, Ohio, is to be doubled. The product of the plant is hollow tile fireproofing, and the demand for same has increased to such an extent that the president of the company, Walter R. Elson, will move to Malvern and give his entire time to the management of the plant.

A meeting of the sales agents of the Fraser Brick Company, of Dallas, Tex., was held recently at the company's office, including men from Beaumont, Wichita Falls, San Antonio and Dallas during which reports from the various agents were made, showing an increase in the company's sales of over 100 per cent. The meeting was devoted to a discussion of methods of salesmen, and plans for passing the record of last year.

At the meeting of the stockholders of the Mayer Brick & Tile Company, Frostburg, Md., the president, Henry Mayer, presented a report showing the company to be in excellent financial condition. The directors were all re-elected and in turn re-elected all of the officers, as follows: President, Henry Mayer; vice president, G. D. Hocking; secretary, R. A. Walter, and treasurer, F. H. Schreiber. A seven per cent. dividend was declared, payable February 1.

According to statements in the daily press, the city of Detroit used upwards of 500,000,000 brick during 1916, of which nearly 400,000,000 were common building brick furnished by the local manufacturers, while something like 50,000,000 were shipped in from other points, and the other 50,000,000 were face brick which have to be obtained from outside points, as the clay in and around Detroit is not adapted to the manufacture of front brick.

J. J. and H. J. Schneider, brick manufacturers of Pearl River, La., have organized the Beaumont Brick Company at Beaumont, Texas, and have started work on the erection of a 50,000 daily capacity plant. They have been experimenting with the clays of that vicinity for some time, testing same at their Pearl River plant. At the start they will make only soft mud building brick, but later on expect to add machinery for the manufacture of hollow tile. J. J. Schneider will have charge of the Beaumont plant, while H. J. Schneider will look after the Pearl River interests.

R. F. Williams, who has been general manager for the Athens Fire Brick Company at Athens, Texas, for the last eight years, has organized a company known as the Athens Brick and Tile Company, with a capital stock of $65,000, which will manufacture fire brick, face brick and hollow building tile. C. H. Coleman is president; George M. Wofford, vice-president, and R. F. Williams, secretary and treasurer. The machinery has been purchased, and it is said the plant will be in operation by April 1. The plant will employ seventy-five to a hundred men, with weekly pay roll of approximately $1,000. The capacity will be 600,000 bricks and 2,000 tons of hollow building tile a month. It is said this will be the largest plant of its kind in that part of the state.

Higgins Avenue, Chicago, Ill. Brick pavement filled with Barrett's Paving Pitch.

Barrett's PAVING PITCH

A brick pavement that never will crack

HERE is a brick pavement in Chicago in which there never will be a crack.

Yes, an individual brick may get broken, but those long, jagged cracks which you sometimes see in cement-filled brick pavements will never appear here.

The reason is that when this pavement was laid in 1908 the joints between the bricks were filled with Barrett's Paving Pitch. In a pitch-filled pavement like this, cracks are absolutely impossible.

Pitch does not make a rigid monolith of pavement as cement does, and so when the foundation settles, the pavement does not bridge the depressions and then break under the weight of a heavy wagon. On the contrary, the pavement simply settles with the foundation.

A pitch-filled pavement presents no difficult problems. There are no expansion difficulties, no blow-outs, no thrusting of the curbing out of line, no damage to manholes by expansion of the bricks. There is no difficulty about making cuts for repair to underground pipes and restoring the same bricks with the addition of a little pitch.

Booklets free on request. Address our nearest office.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING COMPANY, Limited: Montreal Toronto Winnipeg
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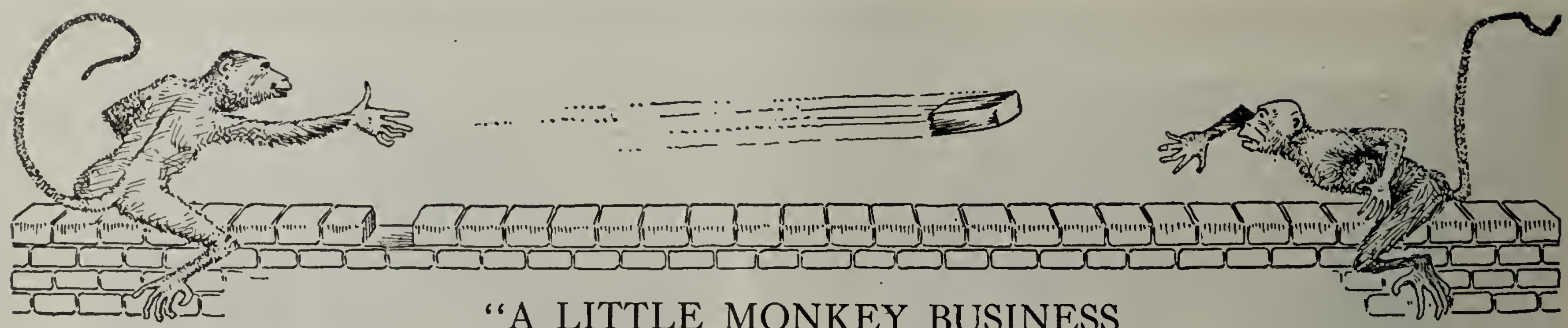


"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Not Afraid.

"An American citizen army would not fear asphyxiating gases of any enemy."

"Why so?"

"Every voter has smoked campaign cigars and survived."—Buffalo Express.

* * *

Reason No. 1.

"Now, girls," said the teacher, "can you tell me why the great man was buried in Westminster Abbey?"

There was a long silence.

At last a girl put up her hand.

"Because," she answered, solemnly and impressively, "he was dead!"

* * *

The Difference.

"God loves the Irish," said Mike to Pat as they were taking up the pavement on Fifth avenue.

"He does that," answered Pat as he looked up and saw Andrew Carnegie whizzing by in a big limousine, "but he seems to help the Scotch."—Ladies' Home Journal.

* * *

The College "Follow-Up."

"My college certainly takes an interest in its graduates," said Jones to Smith.

"How's that?" asked Smith.

"Why, here I get a note from the dean saying he will be glad to hear of the death of any of the alumni."—Ladies' Home Journal.

* * *

Childish Impudence.

Teacher (to dull pupil in mathematics)—You should be ashamed of yourself. Why, at your age George Washington was a surveyor.

Pupil—Yes, sir; at your age he was President of the United States.

* * *

The Reason.

"But, Eliza," said the mistress, "your little boy was christened George Washington. Why do you call him Izaak Walton? Walton, you know, was the famous fisherman."

"Yes'm," answered Eliza, "but dat chile's repetashun fo' tellin' de troof made dat change imper'tive.

* * *

His Hope.

"I suppose you have high ambitions for your boy?"

"Well, I wouldn't say that exactly, but I do hope that he won't turn out to be the male assistant to a female dancing teacher."—Detroit Free Press.

* * *

Infringing.

One morning little Mary hung about the kitchen continually bothering the busy cook to death. The cook lost patience finally.

"Clear out o' here, ye sassy little brat!" she shouted, thumping the table with a rolling-pin.

The little girl gave the cook a haughty look.

"I never allow anyone but my mother to speak to me like that," she said.

* * *

Life.

Chapter I—"Glad to meet you."
Chapter II—"Isn't the moon beautiful?"
Chapter III—"Oozum love wuzum?"
Chapter IV—"Do you—"
Chapter V—"Da—da—da—da!"
Chapter VI—"Where the samhill's dinner?"

* * *

Just Like Him.

He was a college professor, greatly beloved because of his kind heart, but with the common scholastic failing of being very absent-minded. He visited his married niece and listened to her praise of her first-born. When she paused for breath the professor felt that he must say something.

"Can the little fellow walk?" he asked, with every appearance of interest.

"Walk?" cried the mother, indignantly. "Why, he's been walking now for five months."

"Dear me!" exclaimed the professor again relapsing into abstraction. "What a long way he must have gone!"

* * *

One Way to Do It.

It was Christmas week and the car was crowded to its limit. "Here, you!" bawled the conductor angrily. "You rang up a fare! Do that again and I'll put you off the car!"

The little man, jammed in the middle of the crowded car, at once rang up another fare. Thereupon the conductor stopped the car, forced his way through the jam, and projected the offender through the crowd and to the edge of the platform.

"Thanks," said the little man; "here's your dime. I didn't see any other way to get through that crowd."—Ladies' Home Journal.

* * *

Empty and Cracked.

Two men were hurrying along, and met at the corner of a street, only to collide and knock their heads.

"Why don't you look where you are going?" said one.

"I was just going to say the same," said the other, "for you made my head ring."

"Your head ring?"

"Yes."

"That shows it's empty."

"Didn't your head ring?" asked the other.

"No," was the reply.

"Then that shows it's cracked."

* * *

His Generosity.

A "Tommy," lying in hospital, beside him a watch of curious and foreign design. The attending doctor was interested.

"Where did your watch come from?" he asked.

"A German give it me," he answered.

A little piqued, the doctor inquired how the foe had come to convey his token of esteem and affection.

"'E 'ad to," was the laconic reply.—London Nation.

Why

are you satisfied to be unprogressive and to continue to burn up wastefully money that should be turned into your coffers and paid out in the shape of dividends?

don't you get busy to-day and investigate the immense savings possible only with the

UNDERWOOD PRODUCER GAS BURNING SYSTEM?

(PATENTED)

The application of this system to your periodic kilns, either up or down draft, can be done at a very moderate cost and with the absolute certainty that you will get substantial returns that will be a revelation to you.

We will be glad to take up this subject with you if you will just drop a line telling us you are interested.

A Producer Gas Fired Dryer

Is positively the last word in drying clay products. It is applicable to any direct heat type of dryer. When it is done "OUR WAY," that is, according to our plans and with our moderate appliances, the results will astonish you. The investment is not great, in fact, is only nominal, but it is a powerful factor for giving you substantial returns. Drop us a line to-day asking how it can be done.

The Manufacturers Equipment Co.

Dayton, Ohio, U. S. A.

Western Representative: George H. Smith, 507 Reliance Bldg., Kansas City, Mo.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

UNLESS THE COST of building materials increases beyond all expectation, there will most likely be a very encouraging building revival on the Pacific Coast next spring. Scarcity and high prices of structural steel and other metal products has already interfered considerably with building operations on the Coast, so there are many who may defer building until the general situation takes a more favorable turn than is now indicated. The architects have plenty of work on the boards, but it is not unusual for work to be halted. One local contractor has signed up contracts for over a million dollars worth of building for next spring, however, and others are known to view the situation most optimistically. The need for certain classes of buildings is so urgent that nothing short of a general calamity can prevent them being built, yet there is a danger, in such cases, of temporary structures being put up. Already in San Francisco frame school buildings have been constructed recently because of the need for haste in construction and the unreliability of the steel market. The increase in the amount of frame building the past season was exceptional and in the spring some important manufacturing plants are to be constructed entirely of wood. This is not because clay products are higher, but because economy is necessary, and where possible the use of steel products must be eliminated. Both brick and concrete construction have been curtailed by reason of the extended use of steel in connection, yet for all that there has been a ten per cent. increase in the consumption of brick in the year just past. The local brick people disclaim any intention of raising the price on common brick, and it is not likely that there will be any very great increases in the cost of any clay products. Better prices have been obtained on architectural terra cotta lately, but this is absolutely essential to the welfare of the industry. Terra cotta has sold too low for comfort in this market for a long time. The prospects for firebrick, vitrified sewer pipe, pressed brick and paving brick are splendid. The paving brick business in this vicinity is growing steadily and the department is now in a healthier condition than ever before. As the building trades on the Pacific Coast are exceptionally well paid, no material advances in the cost of labor is expected unless the cost of living compels a readjustment. For this latter reason the bricklayers of Seattle have asked for a dollar advance in their daily wage, or seven dollars a day. The San Francisco bricklayers get seven dollars a day, and in Sacramento the brick layers get eight dollars a day for laying extra heavy material.

There is a reasonable activity in the real estate market, especially in home tracts, and for this reason it is not unwarrantable to expect a considerable increase in home building the coming season.

There is need in California for a uniform common brick. The brickmakers in the San Francisco Bay region all manufacture the standard size, 2½ by 8 by 3¾ inches, but in other sections of the state the size and price of brick vary somewhat. The local price remains at $10 per thousand, delivered and $8.50 at the yards. Pressed brick, of course, could not very well be standardized in view of the varying requirements for face brick.

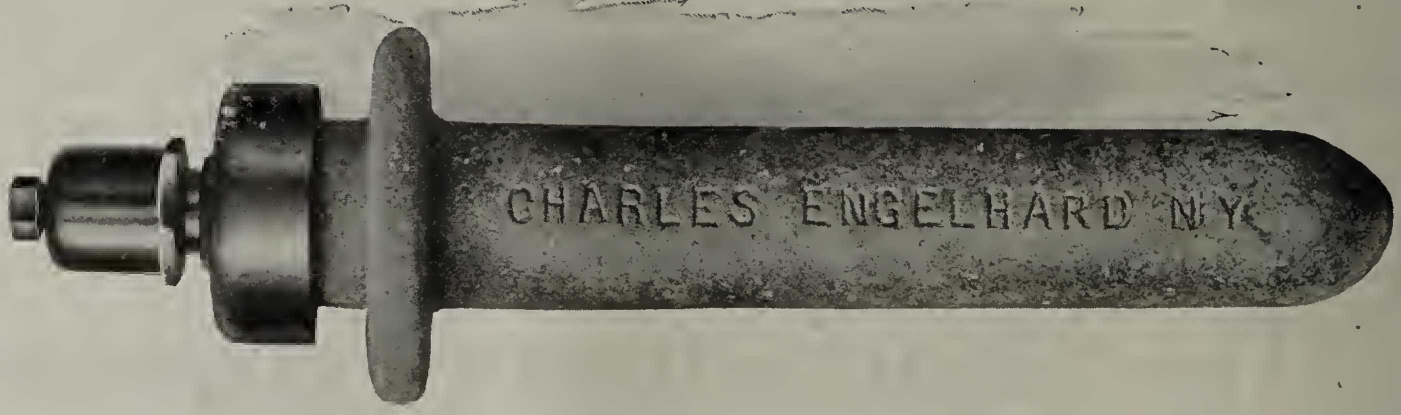
Mr. Gwynn, of N. Clark & Sons, says there is quite a pickup in prospective business, owners and architects showing unusual interest in high class terra cotta products. Many estimates are being called for and a large number of contracts have been signed up already. The Clark company is doing a fine business both in Portland and Los Angeles at the present time, and in San Francisco they have been awarded the contract for supplying polychrome architectural mat glaze terra cotta for a half million dollar theater building being erected at Fourth and Market street. The two street sides of ten stories in height will be faced with this beautiful product.

The Port Costa Brick Works have started to deliver three-quarters of a million common brick for the new Webster School in San Francisco. Mr. Berg, president of the company, says the plant turned out ten million brick during 1916. Operations will be continued all winter if weather permits.

Howard Frost, president of the Los Angeles Pressed Brick Company was a business visitor in San Francisco just before the holidays. The Los Angeles Pressed Brick Company has requested the Board of Public Works in Los Angeles to change the specifications so as to permit the use in any city work of a new radical interlocking brick for which the company claims superior qualities. The new brick is suitable for conduits of any size and for the construction of manholes and flush tanks. The matter has been referred to the city engineer for investigation.

Mr. Funsten, of the Funsten Clay Products Company, San Francisco, has returned from a business trip to Sacramento,

Heraeus Le Chatelier *the Ultimate* Pyrometers



Stand today as they have for the past twenty-five years as the leaders of their class.

No others are so accurate or so thoroughly interchangeable.

None are so easy to use or so practical for severe high temperature measurement. No others give the length of service that these give.

Their slightly higher first cost is due wholly to actual material involved. For example, the Platinum and Platinum Rhodium Thermo Elements are a third-heavier, length for length, than most others.

The advisability of putting this extra small amount into the first cost is proven by the fact that the maintenance cost on Heraeus Pyrometers rarely exceeds five per cent.

Bulletin No. 17 TELLS YOU MORE **CHARLES ENGELHARD** *30 CHURCH ST. New York*

where the Hercules Interlocking tile is manufactured.

From May, 1916 to November, 1916, the expenditure for building construction in San Francisco totaled $292,846,885, according to a report compiled by the Board of Works. The list includes 211 class A buildings. This building record is asserted to be unparalelled in the history of cities.

The California Brick Company, which has two large plants, one for making firebrick at Livermore and the other for making paving brick at Decoto, Cal., is preparing to spend a hundred thousand dollars on improvements before spring. The company's business at both plants has doubled in the past year and it has become imperative to increase the capacity without unnecessary delay. The chief need is for additional kilns and driers. The business is under the management of T. L. Myers, secretary of the company. A large part of the paving brick used in the cities around San Francisco Bay comes from the Decoto plant. The company also manufactures sewer brick extensively.

As the result of having a well drilled on his ranch, near Porterville, Anton Konda, mayor of the city, discovered a large deposit of vivid red clay which he hoped to find suitable for high class clay products. The deposit starts at three feet from the surface of the ground and extends to a depth of fifty feet. Tests are being made of the clay and if these are successful an effort will be made to manufacture the product.

The Sacramento Clay Products Company, with a capital stock of $150,000, has been incorporated at Sacramento by J. P. Dargitz, B. F. Walton, George W. Pierce, H. R. Thompson and C. Tucker.

The new plant of the Los Angeles Pressed Brick Company, at Alberhill, Cal., began last month to make car shipments of firebrick to various towns in the Southwest, including Tucson and Cornelia, Arizona, and Taft, Cal. Forty-five men are at work at the plant at present and this force will be more than doubled within a few months. One large hollow tile building 100 by 200 feet has been completed and is used for hand work and making bricks of special designs. The town of Alberhill now has a post office and a school built of pressed brick.

D. A. Cannon, manager of the Dennison Block Company, of Sacramento, Cal., says the company is still able to compete with the other building material manufacturers despite the fact that the bricklayers charge a dollar a day extra, or eight dollars a day, for laying the Dennison block. The recent advance in the price of brick in the Sacramento district came as a blessing to them.

The Denny, Renton Clay and Coal Company, of Seattle, Wash., sell their high-class vitrified paving brick for $28.75. The company has been manufacturing vitrified sewer pipe and paving brick for over twenty-two years, but have never increased the price of the products nothwithstanding the difference in cost of materials. Efficiency in manufacturing has offset the greater cost of labor and materials.

SUNSET.

San Francisco, January 5.

BIRTHPLACE OF POTTERY IN AMERICA.

Perth Amboy, or South Amboy, just across the river from Perth Amboy, is supposed to have been the place where New Jersey's pottery industry had its origin more than a century and a half ago. Now the locality has three potteries, whose output brings Middlesex County up to second in the state. Mercer County in which Trenton is located is first. Other burned clay materials constitute a larger portion of the output in and about Perth Amboy now. Architectural terra cotta and fireproofing are very important. The men engaged in these enterprises are live wires and allow nothing to be left undone which will improve their industry or help in exploiting its excellencies.

"We have been using the Gandy Belt in connection with our plant for some time, and it has given us very good results. We believe it is less affected by the dust of a cement mill than any other class of belts."

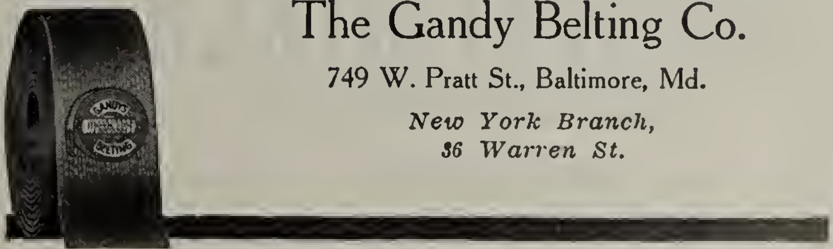
DUST is one of the worst enemies that a good belt encounters in its daily duties.

When it gets between the pulley and belt, it becomes grit, and with the continued pull and traction takes its toll by shortening the life and and service of the belt.

GANDY BELTS, however, are an exception. True, dust affects them, but in comparison with other types, the effect upon a Gandy is a minor consideration. As proof of this, note that the cement industry is one of the biggest fields for Gandy Belts.

Of course, all belt users do not encounter the dust problem, but a belt that will stand up under such unusually severe service will surely make good in ordinary use.

Let us tell you just how Gandy Belts will save you money in your plant. Full information upon request.



The Gandy Belting Co.
749 W. Pratt St., Baltimore, Md.
New York Branch,
36 Warren St.

KILN IRON WORK

BANDS
GRATE-BARS
CASTINGS

Prices reasonable, figured on a narrow margin of profit. Every riveted lap is full strength—figured by engineers—no guess work. Only first class material used. Our workmanship cannot be beat. Rivet holes guaranteed to match—you do not have to use a drift punch and drill to assemble our bands.

Special "Replaceable-End" Grate Bars for inclined grates, made of gray iron, no scrap. All kinds of grate bars and castings furnished. We are big enough to buy and sell at bottom prices, but not too big to give YOU individual, personal SERVICE.

Hook Down Draft Kilns

are giving satisfaction—recently installed in some of the largest plants in the United States. Let us tell you about them.

WE BUILD ALL KINDS OF KILNS.
Our Staff of Masons must be kept busy.

Get Our Quotations

HOOK PATENT KILN CO.
High and Spring Streets
COLUMBUS, OHIO

SEEN IN NEW JERSEY.

IN THE HACKENSACK district all plants are closed for the winter, though the river is still open and shipments to New York are still possible by water. But the sales are generally delivered and few are devoting much attention to such shipments now. It is not easy to learn just how well the manufacturers along the Hackensack have done the past season, but they admit that they found a ready sale at good prices. Perhaps that better be accepted as saying that their business was good as it has been recently, if, indeed, it were not better. The Hackensack product goes into New York and is there swallowed up in the hundreds of millions annually distributed in the greater city and its identity is lost. But if it pays a profitable price at the yards then the manufacturer is satisfied and doesn't need to worry further about whether or not his plant is paying or not.

The Sneyd Enameled Brick Company, of Trenton, is operating the plant formerly owned by the Trenton Fire Brick Company. They have bought this plant and will install machinery immediately, including a new machine for turning out enameled brick. They report a good demand for this class of brick and one that is growing each year.

The American Hollow Tile Company, of New Brunswick, has bought the brick plant formerly owned by B. H. Reed & Brothers, at Hightstown, and will equip it to make their product in addition to making brick. They will install immediately a 32-foot kiln and later a second of the same size will follow. They will also erect tunnel dryers and a storage shed.

According to information received from Trenton and other centers where pottery is made more men are urgently needed to operate the plants to capacity. The shortage is serious in some plants and at the moment it seems quite impossible to secure sufficient workers to operate the plants as the proprietors would like. Orders for pottery seem to pour in in many instances and this shortage of men becomes more and more serious as orders increase.

Perth Amboy is preparing to celebrate its 250th anniversary. The clay industry prides itself upon being the enterprise which has contributed most to Perth Amboy's growth during recent years. Formerly it was an important shipping point. When it was first founded and for some years thereafter, until the Erie canal was opened, in fact, it exceeded New York in tonnage. After the Erie canal poured the commerce of the growing West into New York harbor Perth Amboy's ambitious career was cut short. The clay men have brought back some of its pristine activity and declare that they will restore its supremacy before they develop their establishments to the highest output. The clay industry will assume an important part in the preparations for and the celebration itself.

Perth Amboy is to have a permanent exhibition building. The Board of Trade is preparing to erect a four story structure for its uses and in it will be maintained a museum of all the products manufactured in the town. Inasmuch as clay products lead the others an important proportion of the exhibition will be devoted to brick, architectural, terra cotta and patterns, with tile and similar articles included. Work is to begin on the building shortly and it will be ready for occupancy in the summer.

Newark has few brick stored for the winter. But navigation is still open and it will be possible to receive further supplies from Perth Amboy and elsewhere until the ice shuts the river. After that they will have to come in by train, a more or less expensive proposition. Building operations in Newark and vicinity exceeded anything hitherto known last year and the demand for brick, continuing right up to the last minute, has left the yards bare of stock. The beginning of next season will be attended with shortage and accompanying high prices. Quotations run around $9 now and will go higher rather than decline.

A. L. B.

BRICK NEWS FROM THE TWIN CITIES AND THE NORTHWEST.

THE NEW YEAR STARTS off with a good promise for building—better than seemed possible a few weeks ago. Owing to the short crop last fall, it looked as though there would be restricted operations in building in many sections. But the high prices—in many cases more than double average prices—on various products, have resulted in a better return on the short crop than is often received on a good one. As a result, there has been an excellent volume of collections in many parts of the Northwest, the banks are full of funds which they are ready to loan on desirable paper, and everything is in good shape for a better line of commercial and building operations than last year.

High prices of steel and of other items will have some bearing toward discouraging building. But the same causes which force high prices, have their bearing in urging the need of new buildings in spite of high costs—the demand for goods and the need of better facilities to handle business. Under such conditions many merchants find that it pays to pay the high price of materials, and receive the benefit of the better structures, rather than to wait for lower prices, when as a rule, there is less need for the improved facilities.

Another certain factor in high prices is the matter of labor. Labor has been restless and insistent upon getting more money, especially in bricklaying. Notice has been served upon the city council of Minneapolis, that wages will be on the basis of seventy-five cents per hour. Less expensive labor is also demanding more money, and has the support of the general excuse—the high cost of living, which is generally admitted. But these things will have their bearing toward discouraging new building. If the total result of all increases shall figure to too high a level, some of the prospective work will undoubtedly go over until another season or longer. On the other hand, if there is not too much pressure for higher costs all along the line, the season of 1917, will see a good total. And in this, brick ought to share for more than its recent average.

The stock of brick through the Northwest in the hands of brickmakers seems to have been pretty well reduced in many yards, and it is a question if there is enough in hand to meet the average spring demand, until warm weather allows manufacturing again. Prices have been better during the past season, and the spring ought to see still better prices. The cost of manufacturing is higher, as coal is much higher, wood is getting scarcer all the time, and labor is commanding more money right along. Hence brick ought to bring more money and doubtless will.

The end of the old year saw an apparent rush of building in Minneapolis, it was due to a change of the building ordinance, requiring payment of a fee for building permits, the fee being based upon the cost of the building, assessed at one per cent. As a result, permits were issued for the proposed Y. M. C. A. building, to cost $500,000, although the building will not be started until spring and the plans are not yet started; also for the proposed Builders' Exchange Building, which is not yet ready to start; also for a number of apartment buildings, costing from $25,000 to $75,000 each, though work will not be started on any of them until spring. And since the new year, the permits issued have been very small indeed.

St. Paul building prospects for 1917 are bright. While there have been many disappointments over the delays on the new union station, it seems to be likely that there will be a real start on the work in the spring. The roads interested are also laying out new freight terminals, which will call for a great deal of brick work for the buildings. In commercial work, there are many new buildings in prospect, which will cost a great deal of money. T. WIN.

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NEW JERSEY'S OUTPUT IN THE YEAR 1916.

NEW JERSEY'S pottery product fell off a trifle last year as compared with 1915, though the reduction was relatively small. The total output of all classes was $8,049,338 in 1916, compared with $8,131,356 in 1915, a reduction of $82,018.

Mercer county in which is located Trenton, with its great potteries, leads with an output valued at $6,632,730. But great as this was it was a reduction of $268,467 from the previous year. These figures disclose the further interesting fact that all the rest of the state showed a good increase since the total falling off in the whole state was far below the reduction in Mercer county. This county had thirty-four establishments at work at the beginning of the year.

Perth Amboy, and Middlesex county, in which it is located, report large gains for the year. It was second in the state with a total of $732,791, an increase of $314,756. It has five producers, but they are plants whose output is increasing so fast they can hardly keep up with the growth.

Hunterdon county was third, with $288,989, an increase of $61,421. It has three producers. All the rest of the state had an output of $394,828, an increase of $10,272.

The pottery product of New Jersey represents more than one-half the total of all clay products of the state and it is second in the United States, only Ohio leading. But New Jersey produces most sanitary ware and most china ware, more than forty-two per cent. for the entire United States. It is third in the production of electrical supplies.

The decrease in the output was much less than in 1915, hence manufacturers are inclined to believe they will show an increase during the present year. A number are contemplating enlarging their plants and adding other improvements.

The total value of brick and tile produced during the year was $7,916,080, a decrease of $437,216. But this is a much better showing than the year before so it isn't considered a bad year by manufacturers and others.

The value of the brick made was $3,784,186; common brick, fifty producers, $1,998,416; fancy brick, four producers, $884,919; fire brick, twelve producers, $899,613; ten producers whose output aggregated $100,983.

Forty-six tile makers produced $4,131,894, a decrease of $538,154. Drain tiles, eight producers, $41,331; architectural terra cotta, six producers, $1,430,968; fireproofing and hollow tile, eleven producers, $1,389,120; all others, fifteen producers, $275,378.

The development of the clay industry has been most rapid in the Raritan district and Trenton. Less brick are produced in the Hackensack district than formerly.

The Raritan district has grown very fast during the past few years and the great terra cotta and fireproofing firms are extending their business enterprises so fast that the conditions are bound to remain as they are now for a long time to come.

The great potteries at Trenton seem destined to greater development than they have shown heretofore. Demand for their products since the European war has grown so fast that many additions and improvements, with much over time have been necessary to enable manufacturers to keep up with their orders. If they succeed in holding their business after the war closes they will have a business which will outrank anything of the kind now known in America.

At Trenton the pottery business is crowded to the limit. It was so active this year that the proprietors of the plants were forced to refuse the employes their usual day off at the State Fair. Generally they are given Thursday off, but this year they held every man to his work, and the potteries continued their operations.

Engineering Library

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

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THE CONVENTION CITY

Points of Interest: .Things Seen and Unseen Which Make New York One of the World's Wonders.

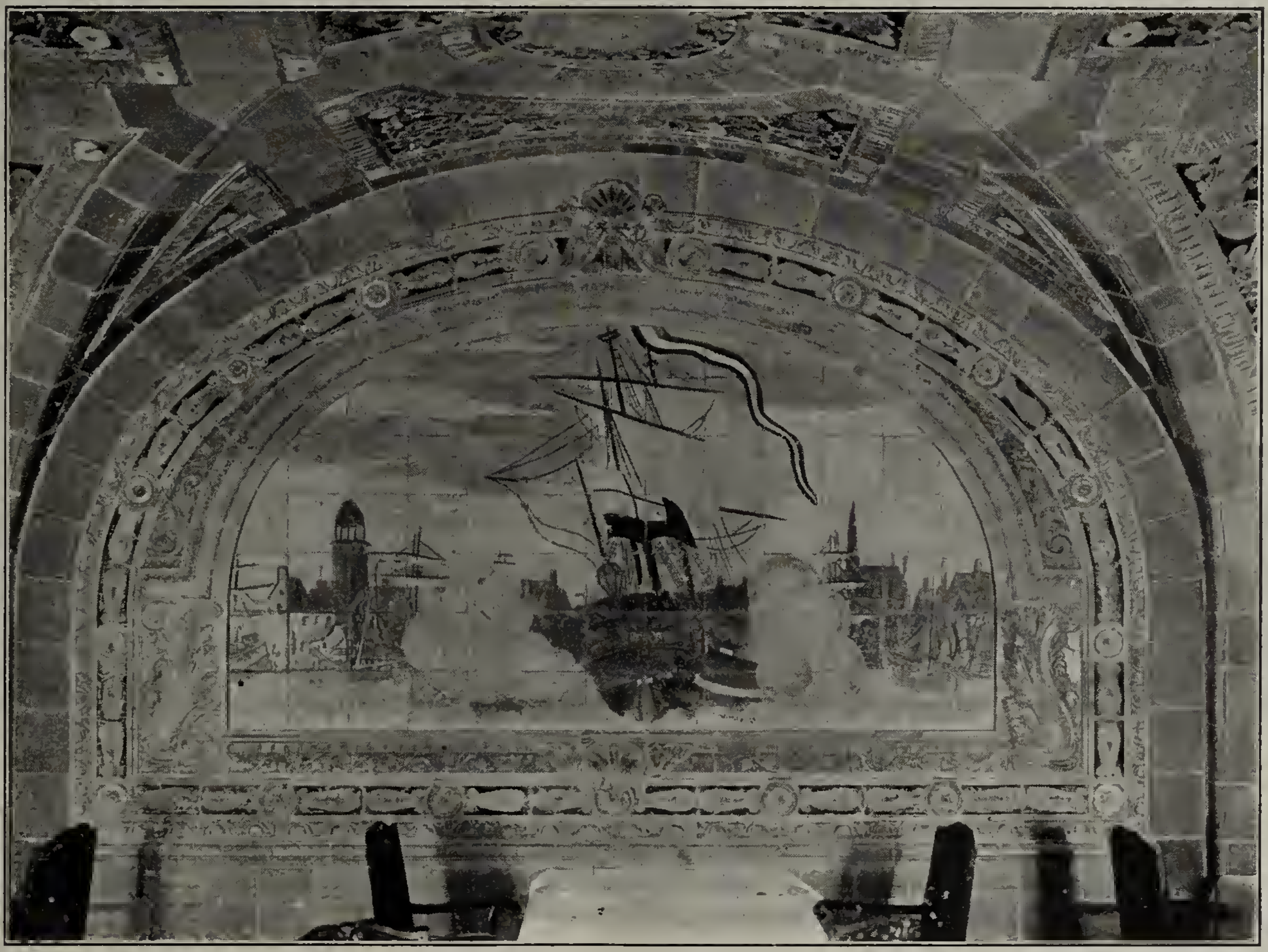
THE WAR IN EUROPE has cut off the source of most of the patterns and designs used in industry in this country. In the infancy of the republic, before things were made here, it was necessary to bring them from Europe, and America has never been able to shake off the feeling that articles made in Europe are somehow better than those made on this side of the Atlantic.

For this reason America has been obtaining from Europe practically all the designs used in industry, from the tile or terra cotta decoration to the design for an evening gown.

During the first year of the war American manufacturers were content either to use again the designs which they had already used, or to obtain such copies as were available abroad, but the continuance of the war has closed this source to them and they have been compelled to look at home.

American artists and custodians of art collections for years have tried to persuade American manufacturers to create a style of their own. To these exhortations industry turned a deaf ear until the war in Europe compelled it to look at home. Now the splendid collections in the Metropolitan Museum of Art in New York City are thronged every day with designers sent there by the leading manufacturers to obtain ideas.

New York City is rich in such sources of inspiration. Of course, the Metropolitan Museum, with its acres of rare and representative collections ranging from 3,000 B. C. down to the present time, is the greatest storehouse, but there are many others.



The British Frigate Firing on "New Amsterdam," Pictured in Faience in the McAlpin Terra Cotta Grill.

The Avery Library at Columbia University contains books of the highest interest to decorators.

Cooper Union has a fine collection similar in character.

The building of the Hispanic Society of America at 156th street and Broadway possesses a striking collection of Spanish art.

The Museum of the French Institute at Fifth Avenue and 48th street is filled with decorative drawings, which are classified upon the plan of the Museum of Decorative Arts in the Louvre, Paris.

The art galleries of the city, with their decorations, contain many hints, to say nothing of the great hotels, theatres and other buildings which have been decorated.

The collections at the Jumel Mansion on Washington Heights, the Van Courtlandt Manor in Van Courtlandt Park and Fraunces' Tavern all contain colonial objects of great interest.

The various "quarters" which are inhabited by immigrants from foreign lands who have brought with them from their homes many art objects, contain innumerable hints to the alert seeker after suggestions.

One of the Greatest Engineering Works in the World.

The huge Pennsylvania Railroad Bridge over Hell Gate, which connects the East River with Long Island Sound, is nearing completion. It is expected that the huge bridge over the roaring floods of Hell Gate will be opened early in March. This will connect all New England through New York by direct rail line with the great centers of the West and South.

Fulton's "Clermont" Making Her First Voyage Up the River.

An elevated standard railroad connects the lines of the Pennsylvania with the tracks of the New Haven system by the construction of nearly three miles of concrete and steel viaduct and the bridging of the East river at Hell Gate from Long Island City to Ward's Island, and of Little Hell Gate between Ward's and Randall's Island, and the Bronx Kills betweeen Randall's Island and the mainland in the Bronx.

This stupendous engineering feat not only realizes the ideal of a direct all-rail route between New England and the South and West, but it further provides a through freight line by way of the New York Connecting Railroad, Long Island Railroad and the short car-ferry between Bay Ridge, Long Island and Greenville, New Jersey, by which the forwarding of freight between New England and points south and west will be materially hastened, and the necessity for the long car ferry through the East River obviated.

The New York Connecting Railroad is a joint creation of the Pennsylvania and New York, New Haven & Hartford railroads. Freight today still moves by the circuitous water route, but passengers destined for New England enter the heart of New York City by an all-rail route, and, with the completion of the Hell Gate Bridge route will continue through to New England with no inconvenient transfer from station to station.

The Manhattan Transfer, just across the Passaic River from Newark, is the starting point of the Pennsylvania-New Haven all-rail route through New York City. Here steam locomotives are exchanged for electric locomotives which draw the trains through the Hudson River tubes into the Pennsylvania station. Leaving the old Jersey City line of the Pennsylvania railroad, through trains to New York follow the standard double track elevated line from the Manhattan transfer across the five miles of Hackensack meadowland to the Bergen Hill portal of the Hudson River tubes.

New York's Great Underground Railways.

The solid rock of Bergen Hill has been bored, and under the City of Weehawken two single track tubes lead down to and under the Hudson River, seventy feet below the surface, and thence up to and under Thirty-second street, New York, to the yards of the Pennsylvania in Manhattan.

Eastward from the Pennsylvania Station run two tubes, each containing three tracks, extending under Thirty-third and Thirty-second streets, expanding into two single track twin tubes and finally into four single tubes under the East River and a part of Long Island City to the entrance to the Sunnyside yards. The East River tubes also are used by the Long Island Railroad trains to and from the Pennsylvania Station.

A short distance from the Sunnyside yards begins the New York Connecting Railroad, the main factor in the all-rail route between Key West and Halifax, and the link which connects the Pennsylvania and New Haven systems.

A viaduct sweeping in a wide curve to the northeast through Long Island City and Astoria leads to the eastern end of the Hell Gate Bridge. The first mile of this is an embankment retained between high concrete walls, with bridges over the streets and avenues. Beyond is a section extending to the east bank of the river, which is composed of steel spans supported by arched concrete piers.

The World's Largest and Most Beautiful Bridge.

The Hell Gate Bridge is not only the largest arch and one of the heaviest steel bridges in the world, but probably is the most beautiful structure of this sort ever conceived. The bridge was designed by Gustav Lindenthal. One of the narrowest sections of the East River, just north of the once dangerous Hell Gate, was selected for crossing the river, and here on the Long Island shore and on Ward's Island, have been erected two massive towers rising 240 feet from the ground, and having dimensions of 140x120 feet at the base and 110x65 feet at the top.

Above the level the towers are hollow, spiral steel stairways leading through them to the track floor, and to the tower roof 250 feet above the level of the river.

At the track level great arches wide enough to permit the laying of a standard four-track railroad through them, rise in graceful proportions to the center of the towers. From these towers springs in a mighty arch the main truss of the bridge in one single leap across the one thousand feet of water, holding suspended from its great arms the roadway of riveted steel and fourteen-inch deep concrete basins in which is laid a stone ballasted four track railroad with a total weight of 76,000 pounds per linear foot.

This track and footway of the bridge is 93 feet wide from rail to rail and 150 feet above the surface of the Hell Gate channel. At the center of the span the top of the two trusses is 310 feet above the water.

New York City's eastern waterway, the East River, is split up into a number of channels by a series of islands. Two of these are Ward's and Randall's Islands. These were used as foundations for the western half of the New York Connecting Railroad Line.

From the Ward's Island end of the Hell Gate Bridge to the crossing of the Little Hell Gate channel, a distance of 880 yards, is a curved four-track viaduct of steel girders supported on twenty-nine concrete arches, rising in some places 120 feet above the surface of the island. Here, as upon all the viaducts and bridges, provision is made for a stone ballasted standard roadbed by the construction of concrete troughs the full width of the standard track and about fourteen inches deep, in which the stone ballast, ties and rails are laid.

A Night Scene on the Hudson River, the "Commonwealth" Leaving Her Dock.

Little Hell Gate is 1,200 feet wide. Across this the engineers have thrown an inverted bowstring truss bridge in four spans of 300 feet each resting on two tower piers at either end and three arched piers in the river. Massive concrete towers 155 feet in height, surmounted by great concrete balls ten feet in diameter, mark each side of either end of the bridge.

Nineteen hundred and seventy feet of arched viaduct carries the line over Randall's Island to the southern end of the Bronx Kills, the narrow stream which separates the island from the Bronx section of the mainland at Port Morris. The Bronx Kills is crossed by a trunnion bascule bridge, with two 175-foot leaves meeting on a pier in the middle of the channel. This bridge is not yet ready for operation.

A short distance north of One Hundred and Forty-second street, the Bronx, the northern end of the New York Connecting Railroad meets and merges into the New York, New Haven & Hartford Railroad, completing the through line. A little less than eleven miles further north, at New Rochelle, trains via this new route join the main line of the New Haven extending to Boston, Springfield and other New England points.

Rapid Transit Facilities for the World's Metropolis.

Another stupendous work of public improvement which is nearing completion is the dual rapid transit system, which, with its equipment, will have cost $352,500,000 when it is finished. Of this huge sum the city itself is paying $186,000,000, the Interborough Rapid Transit Company, which operates the Manhattan Lines, subway service and elevated, $58,000,000, and the Brooklyn Rapid Transit Company, which owns practically all the lines in Brooklyn, $13,500,000. These sums are for construction alone. In addition, the Interborough will pay $22,000,000, and the Brooklyn Rapid Transit, $26,000,000 for equipment. Besides all this, these two companies are putting up $47,000,000 for third tracking existing lines, in order that express trains may be run more readily.

Fifth Avenue, Formerly the Millionaire Resident Street of the Convention City.

When the new lines have been completed, the Interborough Company will have 115 miles of lines of which 53 miles will be new, and the Brooklyn Rapid Transit Company will have 99 miles of line, of which 56 miles will be new.

No less than forty-five firms of contractors are engaged upon this stupendous work of transit building. They employ about 17,500 men.

The completion of these new lines, which is promised for 1917, will make a wonderful difference in the comfort of getting about New York City. The construction work on the new system is about 90 per cent. completed and many sections are entirely finished.

The Seventh Avenue line, on the West Side, will be the continuation of the existing subway from Seventh Avenue and Forty-second street. These two legs will complete the subway "H," with the existing line between the Grand Central Station and Longacre Square merely a crosstown connecting link.

The Seventh Avenue extension from Forty-second street to South Ferry is about 88 per cent. completed. The station connection between Forty-third and Forty-fifth streets is finished. Several of the sections are 95 per cent. completed. This route will be ready for operation in the late autumn.

The Lexington avenue and Seventh Avenue lines practically duplicate the existing subway accommodations. With these branches in operation the pressure on the existing subway will be cut in half.

In addition, the Broadway subway, running through the very heart of Manhattan, will again duplicate the existing subway. From this may be realized how extensive is the relief at hand. The broadway subway alone will relieve the tremendous pressure on the old subway and the Brooklyn Bridge traffic.

It is estimated that the new lines through the center and heart of Manhattan will quadruple the existing service. The Broadway subway now is completed from Trinity Place to Union Square. The sections from Fourteenth to Twenty-

Water Front on Lower Manhattan as Seen When Crossing from New Jersey in the Ferry Boats.

sixth streets are 97 per cent. complete and thence to Thirty-eighth street 73 per cent.

It is expected the Broadway line will be open for shuttle service from Trinity Place to Twenty-third street during the summer months, and then the service extended as fast as the links are ready.

The East River tunnel, which is to carry the Broadway line to Montague street, Brooklyn, is two-thirds finished and probably will be ready in about another year. The Sixtieth street extension which is to carry the Broadway line into Queens, is far behind. But Queens is to get relief from other lines. The Steinway tunnel extensions are being completed rapidly.

Within a few days the first section of the dual system in Queens will be put into use. This is the elevated extension from the Queensboro Bridge Plaza to Astoria. Trains which now run from the Grand Central Terminal to the Bridge Plaza in Queens will be operated directly through to Astoria. When the line is opened it will be possible to ride to Astoria from any part of the existing subway system for a single fare.

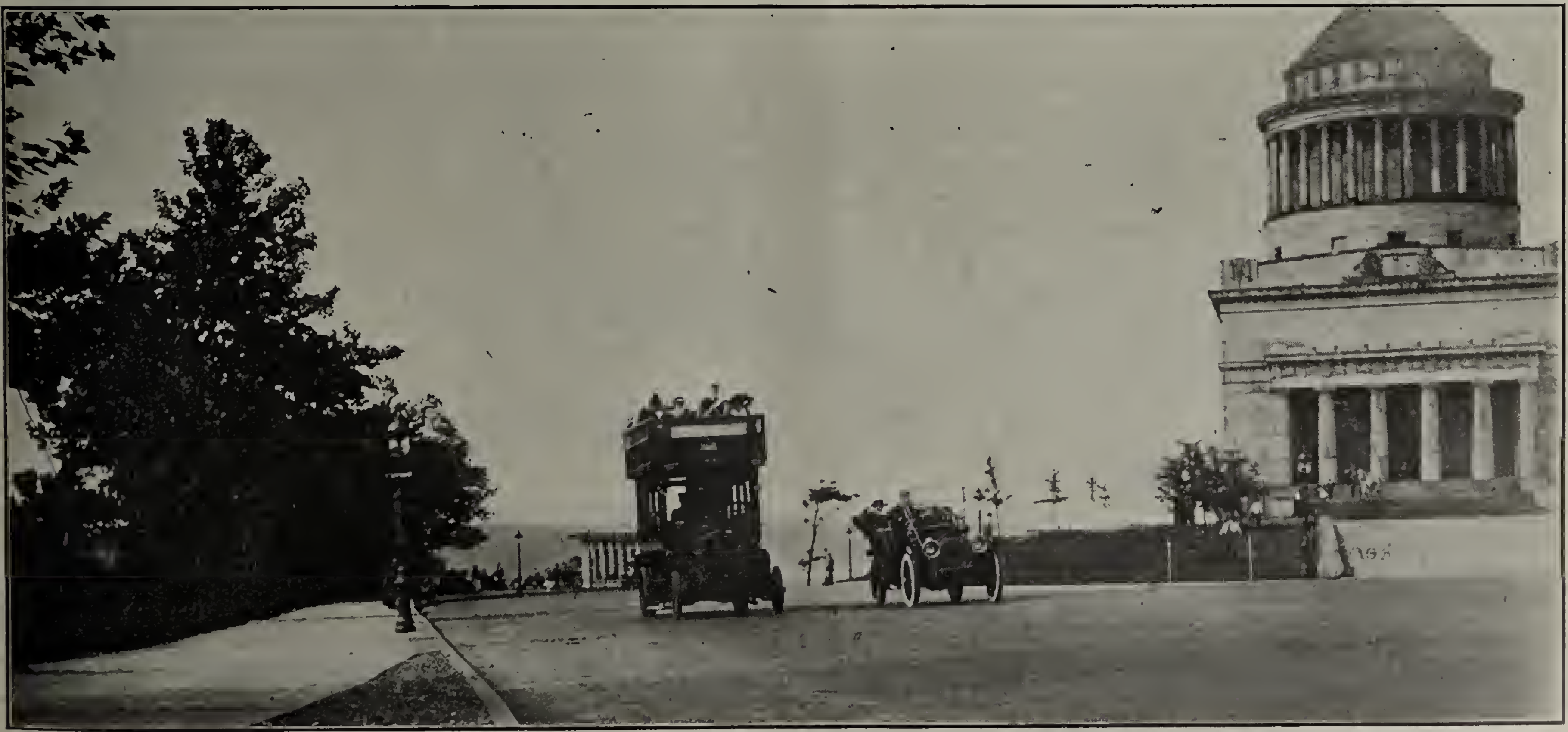
Twenty-three miles of new lines, as incorporated in the dual transit plan, are now in operation. This includes the elevated railroad third track improvements, the Fourth Avenue subway in Brooklyn, extensions in the southern portion of Brooklyn and the center street subway loop from the Municipal Building to Flatbush avenue.

By the end of this year at least 88 miles more of new lines will be in operation, and these will include the routes most needed through the big centers of population.

Including the work on the disconnected branches, before the dual system was started, more than four years of labor have been devoted to the system.

Where Does the Money Come From.

It has strained the city's purse to go through with the subway task. The constant drain on the strongbox has left the reserve supply low. Other improvements have been sidetracked. Already the public has contributed close to $150,000,000 for its underground roads. Another $50,000,000 will be thrown in before the finish sign is tacked up. It has been a strain, too, on the Interborough and Brooklyn Transit



Riverside Drive. A Double-Deck Bus Passing General Grant's Tomb.

corporations. In addition to the millions they have spent they must spend other large sums for equipment. The estimates on which the work has proceeded show that the equipment for the completed system will cost about $50,000,000. Many of the officials now believe that a much larger sum will be required. Unofficial estimates are that the total cost of the entire system may reach $360,000,000.

The work has been in progress so long, the system is so vast and there has been so much of detail published concerning the many branches and routes that the public appears to have become confused regarding the general outlines of the schemes. Certainly there is misconception regarding the magnitude of the work. Officials state that even after they have been at work on the plans for months they are unable to grasp the extent of what is being done. But it is certain that the completion of the dual system, the construction of which was advocated by the Merchants' Association and other commercial and civic bodies against the intense opposition of the advocates of municipal operation, will do wonders toward unifying the city by opening new areas for residence and manufacturing, just as the Connecting railroad will open new territory to transportation and commerce. New York is a wonderful city, more wonderful in fact than any city of fiction for the dreams of the greatest engineers of the world have been wrought into actualities while the people toiled on all unmindful of the stupendous operations going on beneath them day and night. A city wonderful in its achievements and wonderful in its pleasures; so wonderful that with all the remarkable facilities it still is unable to accommodate the constant, never ending, stream of visitors who come by land and sea for business and for pleasure.

Push Carts Bring All Kinds of Food to the Doors of the Tenements on the East Side, New York City.

BURNED CLAY DESIGNS USED AS PATTERN FOR FIGURED SILK.

An interesting feature of an exhibition of silks made by John Wanamaker early in February was the fact that two of the favorite designs were copied from clay cylinders and a disk found in Gautemala. The designs were made by the Maya Indians, a race which inhabited that country 6,000 years ago. One was from a clay cylinder which is known to be at least that age and the other from a clay disk which is probably quite as old. What the designs mean no one has yet deciphered, but the fact that they remain upon the clay sufficiently sharp and clear to be reproduced as a design for silk is a fact worth remembering. No other substance known has ever held its designs clear for anything approaching that length of time. These bits of clay are from the same age of the world as the tablets found in Babylonian ruins, but they are made by a totally different people and are by no means similar. Yet they serve to open up a great mass of speculative research. By-and-by when they are deciphered perhaps something will be learned of the people who made them.

THE McALPIN TERRA COTTA GRILL

NO OTHER CITY in the world compares with New York in modern skyscrapers. These have been developed to a degree of perfection that is the marvel of the building world. Among the greatest of her commercial structures is the Hotel McAlpin. It is a towering monument to the skill of modern builders, in the construction of which brick and terra cotta play a leading part, both as to exterior and interior. The now famous terra cotta grill, which occupies a large part of the first basement floor, marks an epoch in decorative construction, every feature of which is executed in terra cotta from the kilns of the Atlantic Terra Cotta Company, and is indeed a triumph of art in architecture. It may well be likened to the works of ancient artists which adorn the famous galleries. As a color scheme it is unmatched in kind anywhere on the globe. The general tone of the room is a golden brown or "burned ivory," a combination that wears well. That is, one does not grow tired of it, and this is an important element, for it is imperishable and will endure to the end of time, being wrought of the one indestructible material, burned clay.

There are a series of beautiful decorative panels designed by Fred Dana Marsh, illustrating the maritime history of New York. There is the great story of the discovery of the Hudson river where Hudson's boat, the "Half Moon," appears in the lower bay, the placid waters alive with the canoes of native Indians. The quaint outline of the boat with its curious rigging is graphically depicted. There is the British frigate firing upon the "New Amsterdam," in which the red of the ensigns waves a momentary triumph. There is the pathetic tragedy of a hanging in the Old Fort. The river scene changes and the majestic Mauretania, the sister ship of the ill-fated Lusitania, is seen, dwarfing even the skyscrapers and blanketing even the lower portion of the city, its hull and reflection, a quaint symphony in greens, shimmering on the surface of the river; its upper cabins white and gray, the sky a transparent ochre, the funnels the wonderful red. Then follows a night scene of the "Commonwealth" leaving its dock, the searchlight vividly contrasting with the hazy outline of the city. The stately silhouette gives welcome scale to the picture. There is the occasion when Fulton's "Clermont" made her first voyage up the river. There is unusual individuality in the panels, an unaffected bubbling over of color in places, a certain modulating of surface, conventional but natural at the same time. The full water color value is retained, with the added value of texture, neither lustrous nor dull, that has a warmth and light possible only in faience. The visitor to New York who does not spend at least one evening in the McAlpin Grill has missed one of the most charming features of the great city.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

THE BADGER STATE clay industry is confronted with numerous problems at this time, some of which are to be met with in all other lines of industry. Last, but not least, comes the threatening situation in regard to the foreign political difficulty at a time when thoughts were being turned to the question, "After the war—what?" At this writing the possibilities of the situation have not developed to a decisive point, but even the level-headed business man is anxiously awaiting a further move which may bring this country into the great conflict. However, it is noticeable that manufacturers still retain an optimistic view of the future and are not hesitating in the plans for a big season during the coming months.

The past month was naturally one of little activity in this territory. Although the greater part of January was fairly favorable for carrying on construction work, this consisted principally of finishing up old work commenced during the previous year. In Milwaukee the month of January, 1917, showed a decided decrease over the corresponding month a year ago. Sixty-five permits were issued this year for construction work aggregating $298,137, while a year ago, during the same month ninety-seven permits for a total of $2,482,792 were issued. It is pointed out, however, that in 1916 the permit for the erection of the Plankington Arcade building was issued, which alone amounted to $1,250,000. There is no special significance to the decrease, according to well-versed construction men, as there is more construction work planned to be started as soon as the weather opens than there was a year ago, which will be of more benefit locally than one big contract. During the past few weeks construction work has been delayed by a most severe winter season, with plenty of snow and a very low temperature. This has made outdoor work practically impossible.

However, the manufacturers of clay products have been busy on various things. A large number of representative manufacturers were in Milwaukee only a few days ago to attend the annual meeting of the Wisconsin Clay Manufacturers' Association at the Republican House. The detailed report of the sessions will be found elsewhere in this issue.

The high price of building material is one of concern to the manufacturer as well as retailer of brick, tile and other products. Public sentiment is being created against extensive construction work, and politicians are making a grand-stand play on protecting the people's money by advocating delaying work on new public buildings, highways and other construction. The situation as regards the high price of building material and labor is well summed up in an interview with one of the leading men in the field.

"The shortage of railway and water transportation has increased the cost of coal, which in turn, has increased the cost of many lines of building materials, such as brick, terra cotta and cement," he stated. "It would appear that, war or no war, the present under-development of transportation facilities is going to hamper industrial development, with a tendency to maintain the present high price of building materials, for some time to come, even though the present war and our own foreign troubles should be settled. The failure of the transportation system to keep pace with the industrial development of the United States is a vital factor in the augmented building cost. Indeed, shortage of cars has perhaps been as instrumental in increasing the cost as any one factor.

"Another thing of importance is the shortage of labor, which has had much to do with the high prices now charged for building materials. Immigration to this country has been checked by the European war; reservists from our laboring classes have been called back home to the belligerent countries; skilled and unskilled labor has been called from their trades by the unusual inducements offered by munition plants and industries rushed by war orders. This shortage of labor has had much to do with the cost of construction of buildings as well as the cost of production of building materials."

In spite of such facts as stated above, it is freely predicted that 1917 will be the greatest year in building construction that has taken place in this territory. There are under consideration buildings totalling in value $2,850,000, while those in course of construction total more than $3,000,000. The Milwaukee building inspection department predicts an active year in the construction line, with the possibility of breaking another building record.

The Acme Brick Co., 80 Menominee street, Milwaukee, has succeeded the Acme Brick & Sand Co. The change of the corporate name has been filed. The plant of the Acme company at Barton, Wis., is being enlarged and improved. A new boiler room is being added, which will be equipped with two boilers of 160 horsepower each.

Thomas E. Dever, the well-known salesman for Ricketson & Schwarz, Milwaukee, was recently elected second vice-president of the Milwaukee Builders' & Traders' Club. Mr. Dever has long been actively identified with the local club and the honors come in due appreciation of his past efforts.

Clay products that are used in construction work about the home will be featured in displays at the Home and Realty Show, to be given by the Milwaukee Real Estate Association at the Auditorium, from April 9 to 16. Firms exhibiting will probably contribute material to be used in the contemplated construction of a complete model or miniature house. Among the exhibitors of clay products who are taking space are the Acme Brick Co., Ricketson & Schwarz, Wisconsin Mantle & Tile Co., Northwestern Terra Cotta Co. and the Wisconsin Face & Fire Brick Co. The latter is planning an old-fashioned fireplace of the face brick handled as an attraction.

An important rate decision has been rendered by the Wisconsin State Railroad Commission in the Tittemore freight rate case, which materially reduces class freight rates in Wisconsin. The order applies to the Milwaukee Road, Soo Line, North-Western and the Omaha Roads. The decision affects class rates, which means much in the aggregate to the shipper of less than carload lots. Building materials are included in class four. Figuring the distance between Milwaukee and Madison on 100 pounds shipped, the reduction in the fourth class will be the difference between 17.5 cents by the old rate and 14.9 cents under the new schedule, effective May 1. An important feature is that the decision fixes maximum rates for certain distances and no rate now established can be advanced over the rate laid down. Joint rates are also ordered established.

A. BADGER.

Written for The Clay-Worker.

SIDE LIGHTS ON MEN IN THE TRADE

CHAS. J. DECKMAN, BUCKEYE CLAYWORKER, A "JINER" OF HIGH DEGREE, WHO HAS MADE SUCCESS A LIFE HABIT.

IN THE EARLY SIXTIES there rang out on the clear air of Stark county, Ohio, the strong cry of a lusty infant, who evidently intended that his arrival should be well heralded and that there should be no mistaking the fact that a healthy boy had arrived to take his place in due time among those who would be heard.

He developed into a large, strong boy of great vitality, full of fun, a leader in sports and a great favorite in his class because of his good nature, his strong common sense and his reliable leadership.

After completing his common school education at the age of eighteen, he was placed in charge of the Malvern Furniture Factory, owned by his father, and built up and developed the business to such an extent that he was its executive head for eleven years, at which time he associated with other enterprising citizens of his locality in organizing the Malvern Clay Co., with which, in combination with other companies, he is still connected. Developing the manufacture of paving brick, then in its early experimental stage, he has become one of the most successful in the "mud mixing" industry and is known to all of our readers and to the craft at large as "our own Charley Deckman," at present President of the National Brick Manufacturers' Association and past-president of the National Paving Brick Association.

Character Sketch of "Charley" Deckman in the Act of Closing a Contract for a Shipment of Paving Brick.

In the early nineties, by a combination of the Malvern Clay Co. and the Carrollton Granite Brick Co., the headquarters were transferred to Cleveland, to which city Mr. Deckman moved and in which he has become a prominent citizen, active in every progressive municipal movement, and especially prominent in fraternal organizations and active in various associational work.

By a consolidation of the above named companies with the Collinwood Shale Brick Company in 1908, the Deckman-Duty Brick Co. was formed, of which he became the vice-president and secretary. This company was soon recognized as one of the most progressive and forceful in the rapidly developing paving brick industry. In 1916 this company absorbed the Worcester Shale Brick Co., and is now known as the Medal Paving Brick Co., with a capacity of 60,000,000 paving blocks a year and with plans for further enlargement and activities, with "Charley" as vice-president and sales manager.

Mr. Deckman was married to Miss Rachel Miller, of Carroll county, in 1883, and of this union two sons were born, Frank, who died from an accident in childhood, and Charles G., who is now in the business with his father. After a union of more than thirty years, the great loss came to the home in the passing of Mrs. Deckman, and only those who knew him intimately comprehend the loss and lonesomeness that came into his life as a result.

"Charley" has always been known as "some mixer" and a great "joiner." There is hardly a fraternal order that he has not been identified with; he was grand chancellor of the Knights of Pythias, and since 1905 has been supreme representative for the state of Ohio; he is a 32-degree Mason, a Knight Templar and a Shriner; he has been active as commander of the Sons of Veterans and is a popular and respected companion in all his varied activities.

In religion, he is a Presbyterian, and in politics, a Republican; of the latter he allows no one to be in doubt.

Deckman has no "fads," unless it is work; he has come nearer than most men, however, to success in learning to live without eating, by which and persistent walking he has reduced his large girth by nearly a hundred pounds, though his figure could hardly be called "sylphlike" even yet.

The most distinguishing characteristic of Deckman is his practical "common sense," as those associated with him in business and association work can testify and no matter how strenuous may be his arguments, those who differ with him have always found him a fair opponent and willing to take as well as give.

"Charley" is a safe and sane leader of men. Like all good "buckeyes," he is patriotic and has rendered much valuable aid in his work with and for the Sons of Veterans.

His love for his country's flag has led him to place "Old Glory" as a gift in many lodge rooms. The Clay-Worker has referred to him as an "On-The-Job Executive." His middle name is "promptness." When he wields the gavel, proceedings must move on scheduled time. When the hands of the clock in Hotel McAlpin point to the hour for convening the thirty-first N. B. M. A. convention, those who wish to participate must be in their seats ready for business, or they will miss whatever the program calls for at that time.

SOME LUMBERING ARGUMENTS.

In the boosting literature being gotten out by the lumber folks there recently appeared a graphic chart illustrating that everything has gone up in price but lumber. In this chart a comparison is made with 1912 prices and it shows among other things an advance of 17.3 per cent. for brick as against 0.6 per cent. for lumber.

It would be cheerful news indeed to learn that brick prices throughout the country have advanced 17 per cent. in the past four years. However, careful investigation of the basis from which these figures are derived, shows that the brick figures are taken from the prices of Hudson River Common brick in New York City in 1916 and 1912. There was a healthy recovery from depressing prices in Hudson River brick and we only wish that the same order of recovery had prevailed throughout the country.

The comparative prices on lumber, that is the basic figures are from the price per thousand feet of yellow pine on a 23-cent freight rate, while the price on steel is based on the price per 100 pounds at Pittsburg. That 23-cent freight rate added to the basic price of lumber is an item of considerable importance in shaping or determining the per cent. of increase. In other words, it is a case of sharp statistical juggling of figures to produce the effectiveness of contrast. This, too, in face of the fact that our lumber friends are loud and ardent in their advocacy of purified advertising.

Written for The Clay-Worker.

SEEN IN NEW JERSEY.

According to those who profess to know something about what is to come, the outlook for building operations all over New Jersey this year exceeds anything hitherto known. The region around New York is destined to develop faster than any other portion. That includes Newark, the largest city, and Jersey City, the second city of the state, with a host of smaller places, of which Paterson, with 135,000 population, is one. A number of large mills are to be erected in Paterson during the year, at a total cost of approximately $500,000, and they are all to be of brick. No silk manufacturer has yet ventured to use cement in construction work. Paterson is going to erect a new school to cost approximately a quarter of a million and a high school to cost about $500,000 is contemplated for the near future.

Jersey City is to see a good many new factory buildings and presumably a number of schools and business blocks, while the projected buildings for Newark are hard to estimate. In all these structures burned clay will enter in liberal proportion. Perhaps not all of them will be entirely of burned clay, but so many will that the demand for brick and tile and fireproofing will tax the resources of most of the establishments in the state. No stock is left in any of the yards in the northern end of the state and very few are covered at the dealers' terminals for next spring. This means, of course, that everything will have to be made before very many brick can be delivered for the season's work.

The Homestead Brick Company, at Homestead, has just finished its last burning for the season. The last fires went out late in January, an unusual time for a brick plant to be at work in this latitude. And every brick was loaded on the cars and shipped as soon as cooled. They could have sold very many more if the burning had been larger. Demand far exceeds the supply and business might be done at a higher range of prices if the stock was only available.

Brick at Newark is variously quoted, but in the main the price is up to $9.50 to $10.00, with prospect that it will go to $15.00 before the demand for use this winter is over and new brick can be made in the spring. Few agents have any on hand and the prospect of securing more for use when spring opens is remote. Newark builders took everything offered late in the season. Navigation is now closed on both the Hudson and Passaic rivers. The Hackensack river has been closed for weeks, while the Raritan is ice-bound for the winter. All Newark gets after this will be by train and with the outlook for commandeering of cars for use in transporting government supplies, the situation is not altogether pleasing to dealers who realize what will be wanted in the spring. Prices are likely to reach unprecedented figures before new burning is ready for delivery.

The Hackensack Brick Company reports an increased business during 1916 as compared with the previous year, while the outlook for 1917 exceeds that just past. The company has gradually rehabilitated a run-down plant and put it upon a money-making plane. The situation offers every encouragement for future success.

The Mehrhoff Brick Company, of Little Ferry, reports a business in 1916 which satisfied them. They say they were hampered by lack of labor for a portion of the season, but when they finally succeeded in getting laborers they turned out a liberal quantity. They are all cleaned out now and have nothing stored for use in the spring prior to getting out the first burning.

Edward Schmultz, of Hackensack, may introduce a number of improvements at his plant the coming season. His business was satisfactory during 1916, but he could have done more with better facilities and therefore he is contemplating additions. The clay beds are situated so close to the Hackensack river that it is necessary to keep a pump in operation all the time to prevent flooding. This adds to the expense of making, but is unavoidable under the circumstances. His is one of the oldest plants in the vicinity and has been in operation for many years.

The Monument Pottery Company, of Trenton, has just celebrated its twenty-first anniversary. Its new officers are: President, John F. Wolff; vice-president, Harold Wolff; secretary, George E. Hoffman; treasurer, F. J. Wolff. These gentlemen, with John Clifford, constitute the stockholders and the board of directors. This company is the largest individual pottery maker in this country and operates twenty-four kilns. The original company started business with a one-kiln plant with a capacity of sixteen pieces. Its twenty-four kilns, with the necessary warehouses and other buildings, including its own railroad tracks, cover more than ten acres, of which at least six and one-half acres are in buildings alone. The buildings are all of modern construction and the equipment is of the latest design. In fact, the energetic organization has succeeded in placing its product in practically every center of importance throughout the country.

No decision has yet been reached regarding the re-erection of a new plant to replace the one owned by the Kingsland Brick Company, which was destroyed in the explosion and fire of the munitions works there last month. The plant was owned by M. J. Finney, a wealthy politician of New York. It was given out soon after the fire that he would rebuild, but nothing further has been heard about it. It is understood that some sort of satisfactory arrangement has been made by the munitions manufacturers for the destruction of the plant. The insurance policy had no clause which covered such destruction as that. The company made a high-grade of shale brick and operated their plant the year around.

The old windjammers, as the schooners on the Hackensack, used in the transport of brick to New York and Newark, are called, die hard. Some of those now in use have sailed the Hackensack for the past forty years and are seaworthy still. The report is current at the close of each season that they are to be abandoned in favor of tug towed barges, and they have been to some extent, but still they linger and they are now tied up at their docks, fast in the ice, awaiting release from their fetters, when they will again go into service. It is not easy to change the business methods of half a century and they furnish cheap transportation, even though they are slow and sometimes jam in a bridge and hold up thousands of commuters.

Charles Bistrack, of West New York, charged with holding up Herbert C. Mehrhoff, treasurer of the Mehrhoff Brick Company, of Little Ferry, and robbing him of $1,955, was tried in January on the charge of assault and robbery and was given a term in prison. The crime was committed last summer when Mr. Mehrhoff was going to the plant with money for the pay roll. His hand was about ruined in the struggle, the robber cutting it almost in half with a blow from some sharp instrument.

The state museum at Trenton has been much rejuvenated by Miss Helen Perry. She has sought to make it representative of the industrial activities of the state and with the assistance of leading business men and manufacturers has succeeded admirably. The clayworking industries have good representation. An exhibit of terra cotta by the Atlantic Terra Cotta Company, of Perth Amboy, includes samples of the firm's different types of manufacture. The Mueller Mosaic Company, of Trenton, has many excellent examples of pictured tile work. The Fulper Pottery Company, of Flemington, has a good exhibit of its specialties, and Balleek ware is shown by Lenox, Inc., of Trenton. A feature is a case containing an exhibit which illustrates clearly the methods of manufacture of various types of burned clay. Mr. Fulper, of the Fulper Pottery Company, contributed a number of decorative lamps and other articles to make the room in which the museum is placed more attractive. Other clay exhibits are to be added from time to time until they give a detailed exemplification of the different classes of work done in this state.

A. L. B.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART IX.

Salt Glazing (Continued).

IN SOME instances a single salting is sufficient to develop the glaze, but more common practice is from three to six rounds of salt firing with an intermediate fire to raise the temperature. Vaporizing salt absorbs heat just as the vaporizing of water and this heat is taken from the fire which otherwise would go into the kiln to maintain the temperature. If the salting is started at a minimum temperature, or the temperature is reduced to a minimum in consequence of the salting, then before a second application of salt the kiln temperature must be raised, but if the initial salting temperature is in excess of that required, then there may be several applications of salt without any intermediate firing.

The salting period varies from three to twenty-four hours and the quantity of salt varies accordingly.

The fires should be cleaned before beginning the salting and the kiln temperature raised to a maximum, and as previously stated the ware must be at least partially vitrified. When the salting begins the dampers are closed to get a back draft at the furnaces, or at least a balanced draft. The purpose is to let the salt fumes drift into and spread to all parts of the kiln and to give time for the action of the fumes on the minerals in the ware. The salt fumes will clear off in ten to fifteen minutes, when a second application of salt is made, or, as in the more common practice the dampers are raised and the furnaces fired with coal which is allowed to burn down to a clear fire before the second round of salt is made, and this process is repeated as many times as the practice on the yard in question has shown it to be necessary.

In the majority of yards from three to six hours covers the salting period.

A number of authors state that is some localities it is customary to add oil, resin, or other quick burning material with the salt, presumably for the purpose of maintaining the salting temperature, and perhaps to give a darker color to the ware, but we have never seen this done in this country and we do not believe it is common practice. We have seen coal dust thrown with the salt into natural gas fired furnaces for the purpose of darkening the pipe, but later this practice was superceded by the use of a smoky gas flame during the salting.

There are many interesting problems in salt glazing and much work must be done before the process becomes an exact one, and meanwhile each manufacturer must work out the problems for his particular material regardless of the practice in other factories.

There are numerous difficulties which must be overcome some of which are common and pretty well understood,—such as smoked pipe, blown or slabbed pipe, blisters, pimples, crazing and cracking, scumming, light and dark glazes.

Smoked ware has a lustreless gun metal black color due to excessive reducing conditions during which colloidal carbon is absorbed by the glaze. Smoked ware often shows an iridescence, which may be due to sulphur, and possibly the sulphur gases under reducing conditions has had something to do with the dullness of the glaze.

Blowing or slabbing occurs in the watersmoking period of the burning and is said to be caused by the development of steam, the pressure of which forces off large slabs from the surface of the ware. We think the trouble goes back to the press work and that it is primarily caused by lamination planes in the ware.

The drying is done in low temperature rooms and is far from complete, and subsequent rapid drying in the kiln may result in the removal of the moisture from the surface faster than it can come to the surface which would cause the outer layers to become hard dry, shrink, and crack loose, though Garve has shown that cracking occurs while the ware is still wet dark and that there is little danger after the ware becomes white dry or hard dry on the surface even though the core is still quite soft. With the crack once started, the tendency of the layer to straighten out would cause a large patch of the surface layer to peel off.

Movement of the pore water from the center to the surface is not necessarily a factor. Hygroscopic water does not travel to the surface by capilarity but instead is driven out by penetration of the heat into the ware and the vaporization of the moisture from the surface of the clay grains. Some shrinkage accompanies the expulsion of the hygroscopic water and if the operation is carried on too rapidly there will result the same hardening and cracking of the surface layers, and the result is the same as a simple drying crack.

Blisters may be due to entrapped air in the lamination planes which is under pressure in passing through the die, and the subsequent expansion puffs up the surface. Such blisters develop in the green pipe.

Blisters in burned pipe are often due to the gases given off by pyrie, or other minerals, which cannot escape in consequence of the vitrification, or subsequently because of the glaze coating, and their expansion under advancing heat, or their increased pressure in consequence of increased volume, causes the blisters.

In complete oxidation would account for this trouble in some instances, but as has been noted, it is a difficult matter to completely oxidize the sulphur, and vitrification may develop gases from other minerals which would cause the blisters. Perfectly bonded ware, thoroughly oxidized, and not too intensely vitrified and burned under oxidizing conditions as much as possible, will reduce the blistering to a minimum.

Pimples, or rough pipes, are due to the reduction of the iron minerals in or near the surface of the ware and their combination with silica by fusion.

The fused mass naturally assumes a globular form projecting from the surface of the ware.

The globule is formed under reducing conditions and may be softened and absorbed by the body or the glaze under oxidizing conditions. A ware that pimples badly should be subjected to alternating reducing and oxidizing conditions until the globules have been fully developed and absorbed.

Vogt states that he has in numerous instances overcome the trouble by filling the furnaces with fine coal after the salting is finished. In this way he would get a slow fire and strongly reducing conditions which could be maintained, perhaps, without damage to the ware, and which would result in the full development of the globules and maintaining them in a soft condition until they were absorbed.

Crazing and cracking is caused either by too rapid heating up during the watersmoking which would tend to develop fine drying cracks on the surface and crack the sockets, and these cracks would not heal in the burning nor be covered by the glaze. Such cracking is easily distinguished from ordinary crazing in that the glaze penetrates the cracks and it is evident that the cracking occurred before the glaze was developed.

True crazing of the glaze is due to the cooling, or it may be that the body is too dense and cracks under temperature changes.

It requires no stretch of imagination to assume that the glaze may not fit the body. Barringer suggests that the glaze may vary with the composition of the body and it very likely does. We would thus have high silica content, high alumina, high lime, etc., in the glaze, which would explain why some glazes craze badly and others do not. Where the glaze is liable to crazing it is very important that the ware should be carefully cooled in order to get a maximum annealing.

Scummed ware does not take a good glaze simply because the salt fumes do not combine with the sulphate of lime and cannot get through the scum to get at the underlying silica and alumina necessary to develop the glaze.

The color of a salt glaze is affected by the character of the kiln atmosphere as well as by the composition of the body. The natural color of a salt glaze is a golden yellow. Under reducing conditions it absorbs carbon and the color darkens to a brown and even to a dull black. If the body is dark, as in shale pipe, the color of the pipe surface is correspondingly dark, due to the dark background although it is likely that the glaze will contain more iron and have a deeper color than the glaze on fire clay ware.

We have salt glazed the same clay in continuous and down draft kilns, getting from the former a straw yellow, and from the latter a dark brown, due to the difference in the kiln atmospheres.

Bloating and black-coring the cause of which has been explained is a difficulty which may occur in any clay ware where the oxidation has not been satisfactorily carried out in the burning process, and while this trouble often occurs in salt glazed ware it is not because of the glaze except in so far as the glaze may seal the pores of the body and prevent the escape of the entrapped gases. The thin glaze, however, could not develop sufficient strength to resist the pressure required to bloat the ware and the effect of the glaze will be negligible.

It is evident that for salt glazed ware a long safe vitrification range is necessary, and in order to get this range, salt glazed products are often made from mixtures of several clays. Fire clays are most commonly used alone because many of them are silicious, yet retain good plasticity, and are safe drying besides having a long vitrification range. They also stand a temperature which readily develops a good salt glaze. glaze.

Some shales are excellent in this regard, but the majority of low temperature materials require a mixture in order to get a suitable salt glaze body.

Plastic clays give the needed mobility; sandy clays the requisite silica for salt glazing; refractory clays lengthen the vitrification range and hold the ware in shape during the salt glazing period when the failure point is near, and yet the ware must be held under the requisite temperature to devlop the glaze.

(To be continued.)

BRICK WELL LAID

Job Enabled the Contractor to Die Happy.

A good many years ago there used to be a brick contractor in Indianapolis, an Englishman, named John Martin, says Latch String.

He took such pride in his work that it was commonly said of him that he absolutely could not do a poor or cheap job.

He was one of the first men to lay pressed brick in the central West. This was in the days when all pressed brick came from Philadelphia and was known as "Philadelphia brick."

The common brick of his time was not good enough for his use, and as soon as he became strong enough financially he established his own yards and produced a dark cherry brick, which, when laid up in red mortar, appeared at a little distance as pressed brick—even better, according to the less uniform modern standards.

Every time John Martin completed a job he took his foreman over on the other side of the street, or at a distant point where they could get a good look at the building, and he would say:

"There's another job that'll help me to die happy!"

He always went through this little ceremony at the completion of every job.

And I think that he did die happy, if the quality of the work he turned out could make it so. I do know that he lived happily, which is the more important thing, after all; for he was active for many years, and I can see him now in my memory riding through the streets of the Hoosier capital with the top of his buggy down, looking from side to side at the jobs he had completed, with a smile of simple pride upon his honest countenance.

I do not know whether he died rich or not—I do not think that money ever gave him much concern except as a medium for paying his obligations—he seemed to take more pride in laying up brick than laying up money.

Anyhow, if all of us had an attitude towards all our work such as to justify this little John Martin ceremony on its completion, why we would at least live happily—we could even build our fortunes with the same pride that John Martin laid brick.

NO PRECAUTION NEGLECTED.

The little son of a clergyman recently appeared at breakfast with distinct evidences of a hastily made toilet.

"Why, Edmond," his mother remonstrated, "I believe you forgot to brush your hair!"

"I was in such a hurry to get to school," he explained.

"I hope you didn't forget to say your prayers?" she asked anxiously.

"No, sirree!" was the emphatic assurance; "that's one thing I never forget. Safety first!"—Harper's Magazine.

MONOLITHIC BRICK PAVEMENTS

By Floyd W. Allen, Municipal Engineer, Seattle, Wash.

THIS SO-CALLED type of brick pavement is receiving wide consideration over the entire country. It has been received most favorably by some engineers, while others doubt the benefits of this type of construction. In any event, there is bound to be failures along with successes—the failures always attracting the greatest attention and bringing criticism upon brick pavements in general.

Very seldom, if ever, is a failure in the early life of a brick pavement due to faulty brick, but the real truth is never brought home to the layman, a duty which every paving engineer should feel it incumbent upon himself to do.

There is no doubt in the writer's opinion that brick is the most ideal of all surfacing materials for country roads. The paved portion is comparatively narrow, with graded roadway extending only a few feet on either side, and fast automobile traffic, together with slow, heavy auto freight traffic, are only a few items which tend to make brick the ideal pavement.

The wide gap between gravel and macadam roads and brick surfaced roads has excluded the latter in many instances to the advantage in cost of a very much less desirable surfacing. This feature brought considerable thought upon the reducing in cost and at the same time obtaining as desirable brick pavement as laid with concrete base, 1½ or 1-inch sand cushion, with grouted brick surface.

The result of this study was the idea of eliminating the sand cushion and laying the brick in a thin mortar bed, to be laid upon the green concrete. It was thought by this method a reduction in thickness of brick and concrete base could be made and obtain as strong or stronger pavement as under the old method, thereby reducing the cost.

This has been well illustrated by the tests that have been and are being made at the plant of the Denny-Renton Clay and Coal Company by Mr. Charles Newhall and the writer, the results of which are given in the following pages.

In April, 1915, the writer induced the Denny-Renton Clay and Coal Company to consider modification in the present method and try the monolithic construction.

Test Section.

The brick for the trial test were ordered in the same month. The brick were 2¾x4x8½, cut to a 4-inch face and laid flat, or with a depth of 2¾ inches. The county commissioners of King county, Washington, gave permission to lay a test section 125 feet long and 20 feet wide, near Orillia, in the Pacific Highway. This test section was laid during August, 1915, upon a 4-inch base of 1:2:4 concrete. The condition under which this pavement was laid was not ideal, as the ½-inch mortar bed did not follow the laying of concrete until 30 to 90 minutes later, and some of the bricks were laid after the initial set had taken place in the mortar bed. Even under these conditions the pavement has been subjected to the severest traffic for over a year and does not show the slightest fault.

Ten Miles in King County.

This year King county is laying ten miles of this type of pavement, 20 feet wide, between Seattle and Des Moines, using a 1:3:6 concrete base varying in thickness from 3 inches on the edge to 5½ inches at the center, covered with a 1:3 mortar bed and 2¾-inch brick surface. The saving in cost upon this job, as compared with standard construction, was over $8,000 per mile.

In order to secure first-hand data and anticipate the practical test of traffic in time, on this new type of construction, it was deemed advisable to make some large scale laboratory tests. This series of tests has been conducted by Mr. Newhall and myself at the plant of the Denny-Renton Clay and Coal Company. Tests numbers 1, 2, 3, 5 and 12 were made the latter part of September, 1915, and the remaining during the month of June, 1916. Incidentally, the tests determined the relative strength of brick course as compared with concrete base, and the various thicknesses of brick combined with bearing depths of concrete base.

Testing Machine.

These tests were made with a home-made testing machine designed by Mr. Newhall and myself. The machine was designed upon the principle of a lever, as shown in accompany-

Test No	Description of Beam							Strength					Quantities of Materials				Cost per sq yd Material	Relative Cost of Materials	Nature of Fracture
	Base		Surface		Size of Beam			Breaking Load		•• Modulus of Rupture Per sq in	Load per yd of width 66" Span lbs	Relative Strength %	Per sq yd of Surface						
	Mixture Conc	Thickness	Type of Brick	Thickness	Span	Width	Depth	Load at failure	Mean Load				Cement bbls	Sand Cu yds	Gravel Cu yds	Brick No.			
5	1-3-6	6	2¾×4×8½	2¾	66	20⅞	9½	10065	9077	M 521 L 473	13950	100	.223	.093	.150	38	1732	100%	3 bricks & 2 joints
5a	"	"	"	"	"	"		8090											" "
12	1-2-4	4	2¾×4×8½	2¾	66	20⅞	7³⁄₁₆	7189	7552	693	13020	93	.214	.065	.094	38	1.611	93	3 bricks & 2 joints
12a	"	"	"		"	"		7915											" "
9	1-3-5	5	2¾×4×8½	2¾	66	22	8½	7970	7437	463	12170	87	.208	.086	.114	38	1647	95	3 bricks & 2 joints
9a	"	"		"				6905											2 " & 3 "
6	1-3-6	5	2¾×4×8½	2¾	66	22	8½	5440	5812	362	9732	70	.194	080	.125	38	1623	94	2 bricks & 3 joints
6a		"	"	"	"		"	6185											4 " & 1 "
13	1-2-4	3	3½×4×8½	3½	66	20⅝	6½	4720	5217	592	9103	65	.179	.054	.071	38	1.760	102	2 blocks & 3 jts } Repress
13a		"		"	"	"	"	5715											3 " & 2 " } Laid flat
10	1-3-5	4	2¾×4×8½	2¾	66	22	7¼	6100	5430	464	8885	64	.177	.072	.091	38	1.535	89	3 bricks & 2 joints
10a	"		"		"	"		4760											" " "
7	1-3-6	4	2¾×4×8½	2¾	66	22	7½	4490	4680	400	7661	55	.166	.067	.100	38	1515	87	3 bricks & 2 joints
7a		"	"	"		"	"	4870											4 " & 1 "
8	1-3-6	3	2¾×4×8½	2¾	66	22	6⅛	4520	3910	469	6398	45	.138	.055	075	38	1409	81	2 bricks & 3 joints
8a		"		"	"	"	"	3300											3 " & 2 "
15	1-2-4	1	3½×4×8½	4	66	18	5⅜	3100	3105	591	6210	44	.106	.031	.023	42	1642	95	3 blocks & 2 jts } Repress
15a	"	"	"		"	"	"	3110											2 " & 3 " } Vertical
11	1-3-5	3	2¾×4×8½	2¾	66	22	6⅛	3775	3687	442	6033	43	.147	058	.068	38	1,424	82	3 bricks & 2 joints
11a	"	"		"	"	"	"	3600											"
14	1-2-4	2	3½×4×8½	3½	66	21	5¾	3345	3257	464	5583	40	.139	.043	.047	38	1.629	94	3 blocks & 2 jts } Repress
14a	"	"	"	"				3170											" " } Flat
: 4	1-3-6	6	3½×4×8½	4	66	20⅞	11½	2280	3020		5209	37	.202	.121	.150	42	2.113	123	1br. 1jt & diag. through 3 brs
4a	"		"	"	"	"		3760											2 bricks & 3 joints
1	1-3-6	6¼	No Surface		66	20⅞	6¼	2980	2870	361	4951	35	.169	.075	.150		0.642		Along line of load } Plain
1a		"	"		"		"	2760											" " " " } Concrete
2	1-2-4	4¾		"	66	20⅞	4¾		2550	632	4399	31	.160	.048	.094		0.522		Broken in handling } Plain
2a				"	"	"	"	2550											Along line of load } Concrete
3	No base		2¾×4×8½	2¾	66					951	2613	19	.021	.003		38	0.999		Broken in handling } Brick
3a		"		"	"			1515											3 brs & 2 jts } Slab

Remarks: This summary is based on the average results obtained in each test, except in No. 5, where lower of two was used.

In all tests except No. 4, a ½" mortarbed proportions 1-3 and 1-1 grout was used.

• Depth given as measured on fractured section.

*• Values in this section may be used to calculate load for different widths and spans, but not for different depths.

: Old style construction with 1½" sand cushion – Held in place by frame of 2"×12" planks.

Relative costs based on the following unit costs of materials delivered on the job. These prices only arbitrary, approximate prices in King Co. Wn

Cement	2.20
Sand	1.20
Gravel	1.20
Brick block	32.00
2¾×4×8½	25.00

Compiled by
F. W. Allen & Chas Newhall

Summary of Beam Tests Arranged in Order of Relative Strengths, Average Age Eight Weeks ing picture. Water was used to obtain the load at outer end of lever beam. This machine will exert a load of 40,000 pounds, set 40 to 1, and is sensitive to nearest 5 pounds.

Test of Strength.

The details of each test are given in the accompanying summary of results in tabular form. For the purpose of these comparisons the calculated load per yard of width on a 66-inch span is given for each type of beam. The strongest beam is No. 5, of flat, vertical fiber brick, laid on a 6-inch base of a 1:3:6 concrete. This beam is rated at 100 per cent in the tabulated comparison. The relative strength of the beams is given by comparison on a percentage basis.

Materials.

Cement—

Cement used..............................Olympic Portland
Tests show:
Initial set ....3 hrs. 30 min.
Final set ....6 hrs.
Fineness:
98% passing 100 sieve.
83% passing 200 sieve.
Tensile tests in pounds per square inch:
1 day neat 300 lbs.
7 day neat 650 lbs. Sand 340 lbs.
28 day neat 770 lbs. Sand 450 lbs.

Sand—

A washed sand of a commercial grade taken from bunkers at Renton plant.

	Concrete Sand.	Mortar Sand
Mortar value at 7 days (per cent strength of standard sand)	116 %	80.4%
Voids (based on wet packed volume)	22.9%	38.0%
Specific gravity	2.644	2.644
Grading (per cent retained on each sieve):		
100-mesh	1.2	.8
Dust passing 100-mesh	2.7	1.4
Sieve ¼-inch	.7%	0.0%
10-mesh	30.3	1.2
30-mesh	37.6	37.6
60-mesh	22.8	53.2
80-mesh	4.7	5.8
	100.0	100.0

Gravel—

A washed gravel of commercial grade taken from the bunkers at the Renton plant. Grading ¼ inch up to 2 inches.

Brick—

Three different types of brick were used in the test: The old-style repressed, smooth surface block of 3½x4x8½ inches; the new wire-cut rough surface block of approximately the same dimensions, and the new rough surface "vertical fiber" brick, 2¾x4x8½ inches.

The bricks used were of ordinary commercial quality—that is, thoroughly vitrified, free from surface defects and showing an absorption in 48 hours of less than 1 per cent.

Beam Tests.

In calculating the relative strength of the several beams, the following formula was used:

$$M = \frac{3WE}{2bd^2} \quad \text{where:}$$

M = The modulus of rupture.
W = The load at which beam failed.
E = The span between supports.
B = Width of beam.
D = Depth of beams.

All beams, as soon as made, were covered with wet sand and were handled and cured under practically similar conditions.

Tests were made when beams averaged eight weeks old. In all tests the load was applied at the center of a 66-inch span. Beams were from 72 inches to 80 inches in length.

Tests, University of Illinois.

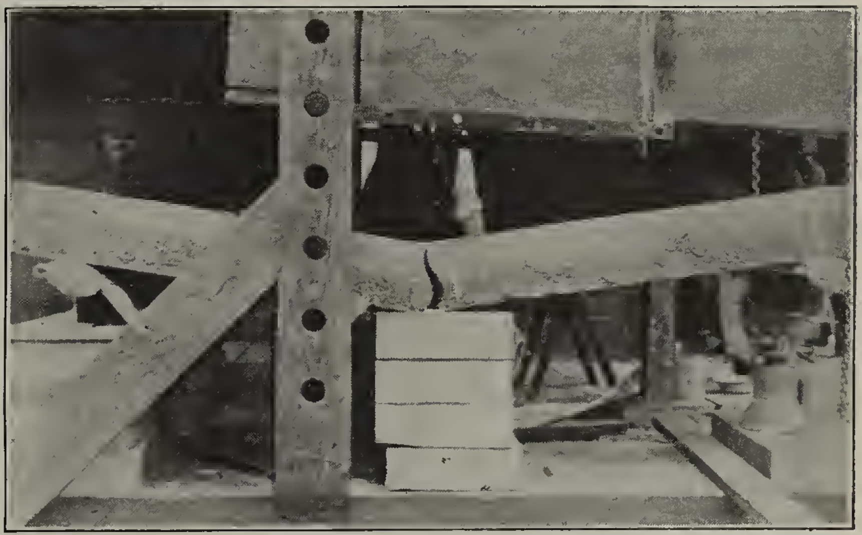
It is well to note, while reviewing these tests upon strength of brick surfaces, that similar tests were made at the University of Illinois by Prof. C. C. Wiley. The following is a summary given in the Engineering Record of the tests which he made:

Results of Paving Slab Tests—Specimens 28 Days Old.

Slab No.	Total thickness, in.	Base thickness, in.	Brick thickness, in.	Total load, lbs.	Modulus of rupture, lbs. per sq. in.
1	7 3/16	4 3/16	3	13,100	465
2	8 1/4	4 1/4	4	21,500	580
3	5	1	4	6,700	490
4	7 1/16	7 1/16	—	12,500	460

It is to be noted by comparison of similar tests conducted at the Denny-Renton plant with 1:2:4 concrete base and 3 inches of brick, they showed a modulus of rupture of only 465 pounds to the square inch, while our tests show a modulus as high as 693 pounds to the square inch.

View Showing Testing Machine with Slab Ready for Breaking.



1:2:4 Base, 4 inches Thick, with 2¾-inch Brick. Showing Nature of Fracture.

Bond in Mortar Bed.

The article in the Engineering Record mentioned the fact of the lack of bond in this one slab, but in the balance a very high bond was obtained. They also make mention of the thin layer of dry material used as a mortar bed being quite porous and soft, compared with the concrete base, as would be expected from the very lean mixture used.

Wet Mortar Bed.

In the foregoing tests made at Renton a wet mortar bed was used, and showed a very high bond between the mortar

(Continued on page 186)

Kiln Department

RELATIVE EFFICIENCY OF UP-DRAFT AND DOWN-DRAFT KILNS.*

By J. D. Pratt, Menomonie, Wisconsin.

THIS IS a subject about which there has been more wrangling than the European War and I am not going to offer any peace proposition.

The construction of kilns is a subject which like so many others must be left largely in the hands of experts. At the same time the subject is one of the most important the clay-worker has to deal with, for if his goods go wrong in the kiln no amount of care afterwards will remedy the damage. Not understanding how to handle the kiln after it is properly constructed is the greatest cause of failure. A kiln of brick should be handled with as much care as a baker would use in baking an angel-food cake and more so, for there is more at stake.

The first thing then to know about in order to save fuel and labor is draft and air. A kiln with too much draft at certain stages of burning is just as bad as one not having enough.

The subject of kiln construction is so large that I will not try to give any detailed description as to their construction but will say, "the man behind the shovel is the man that saves the fuel" in any kind of a kiln.

Up-Draft Kilns.

Up-draft kilns on the whole are considered wasteful of fuel, owing to the short distance the flame has to travel. Before it reaches the goods, the flame is unduly cooled and imcomplete combustion products result. This refers to the old fashioned up-draft kiln. The fuel should have sufficient space for a perfect flame to be formed before it comes in contact with anything to be heated, and this is one of the reasons that down-draft kilns are considered more satisfactory. But with the present up-draft kilns with their outside furnaces and combustion chambers their efficiency has increased as a fuel saver and producer of good even burned brick with very little waste and few chipped or over-burned or crooked arch brick.

Now right here is where the fuel saving comes in. Fire is chemically mixing of certain combustible substances with a supporter of combustion in such a way as to produce light and heat. Just what these elements are and the most effective manner and means of bringing them together so as to produce the greatest amount of available heat are among the most difficult questions with which the practical brick manufacture has to deal. The most critical period in the process of brick making is the burning of the kiln. Clay, weather and all other conditions may be ever so favorable, but without a successful burning all is failure.

After your up-draft kiln is ready to fire, platting raised (we use double platting put on in the checker board fashion and raise every fourth brick), start the fires in the ash pit with wood or slabs with the ash pit wide open and the furnace doors closed. Keep this up until the kiln draws in the smoke and has a good draft, then raise the fires on to the grates in the fire box. Then fire with smokeless coal or whatever kind of fuel you watersmoke with.

But go slow. You save money by not being in too big a hurry when you commence firing. Fire with ash pit and furnace doors wide open to get all the draft you can to drive the heat to the top and the steam off. After the kiln is dry, commence to heat up with the coal you use in burning. Increase the heat gradually with the ash pit doors open. Always keep them wide open and the furnace doors closed with about an inch opening to admit air and over draft. If your center is hard to get, set the upper half of the center more open. After the kiln is hot all over the top and the platting down, commence the hot firing.

Now this is where you can save fuel or burn double the amount necessary. To admit the proper amount of air to produce perfect combustion and no more is what the burner has to look after.

The hydrogen of the gases from the coal or other fuel, the oxygen necessary to supply combustion are derived from the atmosphere. Therefore keep the grates and ash pits clean so the fire shows bright in the ash pit. Keep the furnace doors opened from three quarters to one inch. Keep the grates covered with not more than three or four inches of coal, fire light and often. Never let the fires darken before you fire. Klinker every six hours. Oftener if they need it. Klinker with your furnace hot. Never open the door to drive the fire to the center. Keep the furnace as hot as the arches will stand, and keep even fires, and you will be surprised at the amount of fuel you will save in burning an up-draft kiln.

Some of the kilns we use are of the Wingard type. One furnace burns two arches, and others burn three arches. The flames do not travel direct into the kiln but strike the back-wall of the combustion chamber, whirl over and around in the chamber until the gases are ignited, and then are drawn into the kiln arches; and it is almost impossible for cold air to get into the kiln.

Down-Draft Kilns.

The down-draft kilns used chiefly for burning brick are the rectangular and the round. But the main principle is that of allowing the flame and hot gases to first travel to the top of the kiln, and then to be drawn down and away at the bottom. It is the same in all. It is this great length of travel which causes the efficiency of this kiln in the matter of fuel and also helps very considerably in the production of a uniform temperature, as the air necessary for combustion becomes thoroughly mixed with the gases before they come in contact with the goods. (Here also is where the combustion chambers in the up-draft play their part.) One of the points in favor of the down-draft is that the most strongly heated brick are at the top of the kiln and have no other goods placed above them so that they retain their shape better than in up-draft kilns.

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*Paper read before the Wisconsin Clay Manufacturers' Association at their convention held in Milwaukee, Feb. 1-2.

It is essential that brick or other goods should be set in such a manner as to create an even draft throughout the kiln, otherwise the temperature will vary too greatly in different parts of the kiln. It is here that skilful and careful setting is of importance, even with common brick.

We use our down-draft kilns chiefly for burning face brick, such as red face, red hearts, colonial rough face and flashed colors; and each grade requires a little different kind of firing, but we have good burns every time with a saving of fuel. But as in the up-draft the burner is the greatest factor in the saving.

Now I will tell you how we burn them. After the kiln is ready to fire, open the dampers wide and keep them open until the ware shows red on looking through the upper peep hole in the door. Up to this time the watersmoking and firing are the same as in the up-draft kiln. Now lower the dampers until the kiln draws good without roaring. Fire this way for a few hours. The kiln will be full of heat. Then raise the dampers and give it a good draft for an hour. Then drop the dampers to where they were before. Continue this until the bottom of the kiln shows red. Then bottle your heat in the kiln by closing the dampers until there is just enough draft to keep the fires from backing out through the furnace doors. Do not fire as heavy as you do with more draft, but fire light and often with bright showing ash pits over draft enough to produce combustion. Continue this for two or three hours. Then let the kiln "breathe" as we call it, by partially opening the dampers and fire strong for an hour or more. Then lower the dampers as before. The damper is the throttle of the kiln, the same as the throttle of an engine. One controls the heat, the other the steam.

Setting is of as much importance as anything to get good results. We set our bottom course stringer fashion so as not to obstruct the opening in the floor. Then two or three courses—three over three—then up to the top of the bag walls—eleven over four—except in the center where we keep it more open—five over two (10 feet in diameter.) Set the rounders tight up to six courses of the top set. Then loose the rest of the way up. Set the brick tight every other course around the bag walls and if you do not save more fuel and get better results than you ever did I will present you with one of my famous brick watches.

Our down-draft kilns hold 115,000 brick and we burn them with from seventeen to twenty tons of coal, or with from twenty-four to twenty-seven tons of screenings. Our up-draft kilns hold from 350,000 to 400,000 brick and we burn from seventy-five to eighty tons of coal or from eighty to ninety tons of screenings. This gives the down-draft the medal. And for up-keep and efficiency are superior to the up-draft kiln. I may be a little away from the subject head of this paper; but I claim the efficiency of any kiln is in the handling of it thereof.

"Selah."

General Discussion.

Great applause followed, showing the high appreciation the members had of the paper.

President Hilker: This paper is now before you for discussion.

Mr. Haigh: Gentlemen, this is one of the most important papers I ever heard at any convention. The statements Mr. Pratt makes are based upon long experience and every word of it is true. What he said about setting the brick in the kiln is very important, and every one of you should understand that. His careful method of firing the kiln is very largely the cause of the good results he gets. But there ought to be more brick manufacturers here to hear such a paper as this. They could learn more and get more valuable suggestions about burning their ware by coming here and listening to these papers than they can by staying at home. A copy of this paper ought to be sent to every brick manufacturer and member of the association and I make a motion that the Secretary be instructed to have copies of this paper sent out to all the members.

Mr. Nushaw: I second the motion. This is a good paper and contains many valuable suggestions about firing the kiln. But there ought to be more present to hear such papers. There ought to be some way of appealing to the manufacturers and getting them here to listen to such papers as this. But it seems to me that the fellows that need help the most stay at home and only the wide-awake ones get here.

After further discussion by various members, Mr. Randall kindly offered to print extra copies of the paper and furnish the Secretary with a sufficient number for distribution to all members of the association; and this offer was accepted with thanks by a rising vote of the convention.

NEW YORK AND VICINITY.

BRICK IS scarce and high in this market. Yards have suspended operations for the winter and only the stock available until burning begins next spring is that which has been stored. Practically all the brick left at the yard is spoken for, or will be before new burning is available. The price is now $9.00 to $9.50 for Hudson River common, while No. 1 hard is quoted at $9.25 to $9.50. Very many building contracts are under way and it difficult to determine just what may be done. But the outlook favors increased operations next season, with the market growing stronger each day. Brick is getting to be a very necessary commodity in the New York market and unless the output is increased the coming season will go to unprecedented prices. Some are predicting $15.00 before the new burnings are ready for delivery in the spring.

The figures given by one authority for brick needed for building operations in New York between the first of February and the first of March were 23,805,000. There was in the New York market at the time the figures were given out thirty-four barge loads, of which two were consigned to one firm and four to another leaving twenty-seven to be distributed. These aggregated 10,800,000 brick. One of the towing companies tied its boats up for the winter shortly after the opening of February and no more brick can be taken down by their tugs until after March 1. The Raritan district had on hand at the time only sufficient brick to handle spot sales and the price was from $9.25 to $9.50. The total quantity in hand on December 1 was 30,000,000 compared with 60,800,000 on the same date a year ago. One tow with five barges came down the river early in February, which was the last until navigation opens in the spring. The outlook for higher prices is very promising. Builders must have brick to continue their work during the winter, but they will be reluctant to pay the price asked.

New York men interested in brick are looking forward to the national convention next month with pleasurable anticipations. They feel confident that they will have a profitable as well as an enjoyable session and are exerting themselves to make the visitors feel at home. New York is a great convention city, but it is so big and its own population is so large that conventions disappear in it as though they never existed. For this reason it is not difficult to make any sort or size of a convention feel at home and comfortable. Local men appreciate this and feel sure that after the brickmakers go away they will understand what a real convention city is like. They won't learn how to make brick without straw while here since that is impossible in New York, but New York will gather them in quite as it gathers in all others who come here, show them many wonderful things, provide them with unsurpassed entertainment, no matter what may be undertaken, and send them forth with a keener appreciation of the world's greatest city and the marvels it contains.

BURTON.

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

THE EFFECTS of the abnormal conditions which held back business in 1916 are still to be seen in the local market, but a more promising outlook is reported and local handlers of face brick and terra cotta anticipate a heavy demand, starting the middle part of this month. The possibility of rains has retarded building operations somewhat, and has kept street improvement work almost at a standstill. This has resulted in a very slow call for sewer pipe and sewer brick. Activities in interior sections include many comprehensive new homes and country places and manufacturers of terra cotta anticipate a revival of interest in their product that will mean a distinct increase in business this year. While a heavy volume of business is expected, competition is too keen to allow of as great advances in prices as the general conditions would warrant. However, to most of the terra cotta manufacturers a year of even half way reasonable returns is a very acceptable change from the precarious business outlook of the past few years.

Building in San Francisco, as well as in other California cities, has started out remarkably well, ranging for the month of January all the way from about 65 per cent. of increase in San Francisco to nearly 200 per cent. in Los Angeles, as compared with the same month of 1916. In San Francisco the valuation of the building permits for the first month of the year was $1,622,000, as compared with $947,000 for January, 1916. There was a gain of over $250,000, as compared with the December preceding, which was in itself a good building month for mid-winter. In Los Angeles, where some permits for unusually heavy work were taken out in January, the total valuation of the permits for the month reached $4,709,000, breaking all previous records and showing a gain of about 200 per cent. over the best months of the last two years. The city of Oakland, on the east side of San Francisco Bay, also showed a stiff advance over either the month preceding or the month of January, 1916. The total of Oakland for January was $433,000. The smaller cities and towns of the state showed nearly proportional gains. When all this work gets under way, it is certain to call for a large amount of brick and terra cotta.

Ransome-Crummey Co., local contractors, have been awarded the contract for the construction of a 14-foot central strip of vitrified brick pavement for 400 feet on Newcomb street.

The city of Los Angeles has advertised for the delivery of a large quantity of sewer brick at Hyperion, for the completion of the outfall sewer project of that municipality.

Victor E. Poilet, sales manager for the Brick, Lime and Sewer Company, of Spokane, Wash., reports a very successful year's business in 1916 and that the new year is starting out as well as could be hoped for. The company's terra cotta plant at Clayton will be busy until the middle of this month on the contract for $20,000 worth of work in the new Jones building at Tacoma, and plans are under way for a similar building in Spokane. Shipment of the Tacoma job has already begun. Their lime plant at Bayview, Idaho, started the new year with kilns and a daily capacity of 500 barrels of lime, while the common brick plant at Freeman is again working at its full capacity of 150,000 per day. The company's second plant at Clayton, which makes fire, face and other brick, ran full through the whole year of 1916. The drain tile, sewer pipe and flue lining plant at Spear is temporarily closed for repairs.

Notice has been given that the Sacramento Clay Products Company has been incorporated.

The Santa Barbara Brick and Tile Co. has been authorized by the commissioner of corporations to sell $15,000 worth of stock, the proceeds to be used to purchase additional machinery and appliances.

Word was received here this week of the death, at North Plains, Ore., of F. R. Van Stralen, tile and brick manufacturer.

Gladding, McBean and Company have begun shipment of terra cotta for the new Southern Pacific building here and its installation will start next month. Athol McBean, of this firm, is at present in the East on a business trip, while F. C. Davis is expected back from Honolulu the middle of this month.

The Oregon Brick and Tile Co., with a capitalization of $40,000, has been incorporated at Portland, Ore., by C. I. Moody, W. L. Mason and F. B. Riley.

The California Clay Corporation, of San Francisco, has been permitted, by the commissioner of corporations, to issue 500 shares of common stock to Arthur S. Cunningham for a lease on property in Amador county and to sell preferred stock with a bonus of one share of common stock for each share of preferred, par $100 per share, to net the company not less than 85 per cent. of the selling price. This company has been organized to manufacture fire brick, sewer pipe and other clay products from raw materials taken from deposits in Amador and Sacramento counties. Approximately $85,000 will be required to install machinery and put the plant on a going basis and for this reason the commissioner has required that the company must secure subscriptions for not less than 500 shares of preferred stock on or before June 1, 1917. If this is not done, none of the money subscribed can be used.

The Funston Clay Products Co. reports delivery of a large quantity of faced brick and hollow partition tile for local building activities. Faced brick is in especially good demand.

The Los Angeles Pressed Brick Co. has requested a change in city specifications which will permit the use of a new radial interlocking brick in certain classes of work. It is claimed that this type of brick is suitable for conduits of any size and for the construction of flush tanks and manholes. The board of public works has referred the matter to the city engineer.

A large hollow tile building, 100x200 feet, has been constructed at the new plant of the Los Angeles Pressed Brick Co. at Alberhill, Cal. The structure is used for hand work and special types of brick.

O. L. Emery has assumed management of the Standard Brick and Tile Co., Colton, Cal., and the plant is running at its full capacity of 110,000 brick per day. This plant is furnishing the brick for the new San Bernardino County Hospital.

The Molalla Fire Clay Co., with a capital of $100,000, has been organized at Oregon City, Ore., for the development of fire clay products at Molalla.

At the annual meeting and banquet of the Los Angeles Building Material Dealers' Association in Los Angeles, a couple of weeks ago, the matter of erecting a big downtown brick office building for the use of the association and such of its members as might wish to secure office space in it, was taken up and discussed. It is planned to have a building of striking architectural and practical merit, and to have it constructed as nearly as may be of home products. At the meeting a laughable farce concerning the erection, in 1999, of a 165-story structure at Los Angeles was staged by Fred E. Golding. Speeches were made by Robert Bostwick, the new president, and by H. B. Potter, the retiring president, and others.

An attempt to permanently retire adobe in favor of brick and concrete as a fireproof building material at the old mission town of Santa Barbara, Cal., has stirred up quite a controversy, though as far as can be learned, practically nothing in the way of adobe construction is being done nowadays at the southern California winter resort. A proposed new building law at Santa Barbara would considerably extend the fire limits and prohibit adobe construction within those limits;

but as soon as the law came up for discussion, the protests began to pour in, most of them being of a sentimental order from those who disliked to see adobe building consigned to the limbo of forgotten things. It is understood that the protests have been overcome and that the new law will be passed.

Charles I. Moody and W. L. Mason, of Portland, Ore., have closed a deal for the purchase of the plant of the Beaverton Brick & Tile Company at Beaverton, Ore., including about fifteen acres of good clay deposit adjacent to the works. A new company has been organized by the purchasers, to be known as the Oregon Brick & Tile Company. The new company will specialize on drain tile. SUNSET.

THE PRACTICAL APPLICATION OF PYROMETERS FOR BURNING CLAY WARE

ECONOMICAL plant operation is today the clayworker's greatest problem. This means the elimination of fuel waste, labor waste and time waste. These three elements of plant inefficiency probably enter into the operation of kiln-burning more than any other of the several processes in the manufacture of clay ware. The modern steam shovel and narrow-gage road have materially lessened the time and labor of digging and carrying the clay to the plant. The clay is then ground, mixed and molded, all of which has added to its value. It is then taken to the kilns and burned. In this final and most costly operation most of the loss takes place. All three elements of time, labor and fuel are of most importance. In addition, the material itself may be ruined by the neglect of any of these three elements of operation. Burned tops, underburned bottoms, poor color and low percentage of "firsts" may result, and sometimes the entire kiln is a blackened mass of hard clay, which has to be painfully dug out.

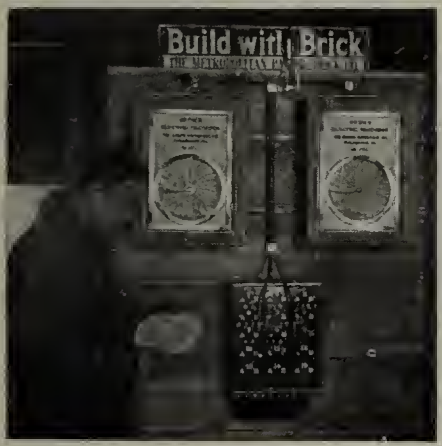
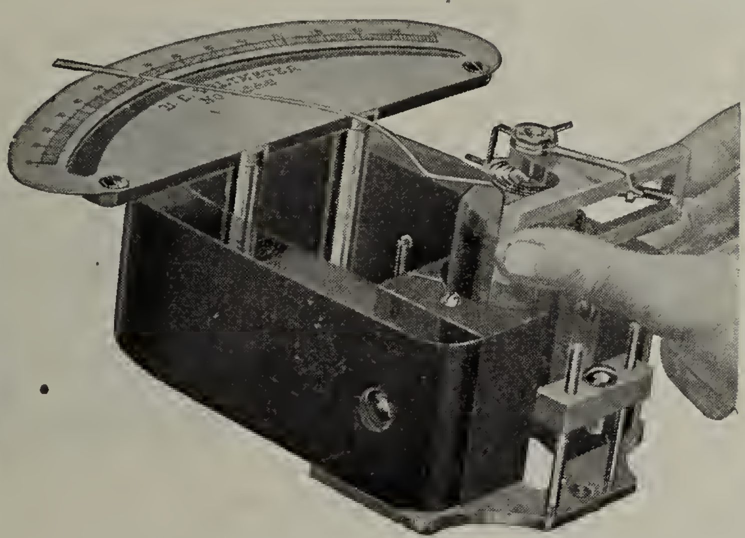


Fig. 1. Burner Reading Kiln Temperature.



Fir. 2. Moving Element and Magnet.

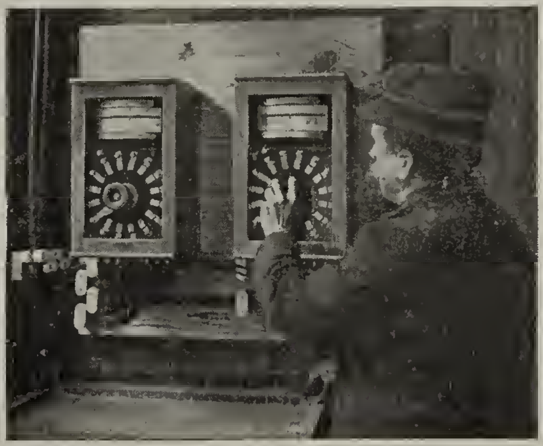


Fig. 3. Superintendent Noting Record of the Kiln Firing.

These serious conditions have led to the adoption of pyrometers by many of the most progressive clayworking plants. The pyrometer equipment consists of two distinct parts:

(1) A thermo-couple; which is inserted in each kiln, and

(2) The indicating and recording instruments on which the temperature is measured and recorded.

These thermo-couples are composed of two wires of dissimilar metals, welded together at one end. The closed end, when applied to the heat of the kiln, generates a small electric current, which is read in temperature degrees on the indicating and recording pyrometers.

A number of different alloys of steel and rare elements have been used for thermo-couples. The most durable and lasting thermo-couples are composed of chemically pure platinum and platinum rhodium wire. The couple has a melting point of 3150 deg. F., so that the usual temperature of the kilns, which rarely exceeds 2150 deg. F., is not a very severe condition for these couples.

Thermo-couples are also composed of nickel steel alloy, which, however, are not so suitable, as they are rapidly attacked by gases in the kilns.

Base metal thermo-couples, as they are called, also crystallize at temperatures around 1800 deg. F., and their accuracy is affected accordingly. Protecting tubes are used, however, and great care has been taken in their selection for pyrometer services. A robust fire brick tube is first installed through the crown of the kiln, 3 or 4 feet from the apex. This tube is allowed to extend into the kiln about 1 inch. An adjustable flange fixes the distance, and the tube can then be fastened in with fire clay.

The thermo-couple, which is usually of platinum rhodium wire, is protected from the kiln gases by an impervious porcelain tube, and is then inserted in the fire brick tube. A weather-proof cap is used to eliminate any danger of water or dust getting within the tube and causing damage.

Both the indicating and recording instruments are patterned on the same design, except that one merely shows what the temperatures are at that precise moment, while the recorder makes an actual record of these temperatures throughout the entire burn, if desired. This construction consists of a large permanent horseshoe magnet, between which is centered a moving coil, with the indicating pointer or recording arm attached.

The small electric current generated by the thermo-couple flows through this moving coil, as sketched, and disturbs the magnetic flux flowing through the poles of the magnet, this causing the pointer to deflect in proportion to this disturbance. The amount of current flow is about 20 milli-volts for a platinum rhodium thermo-couple at 3000 deg. F. This is a very small current, but sufficient to operate the instrument. The earlier type of instruments were too much of the laboratory type to meet the requirements of most brick plants. The pointer of the instrument was suspended by a thin wire about the thickness of a hair, and had to be carefully leveled and mounted on a brick foundation.

Great improvements have been made in very recent years to overcome this delicate type of construction. The instrument now used does not have the fine suspension wire, but the bearings are jeweled like those of a watch. They require no leveling and practically any wall can be used on which to mount them.

An indicating pyrometer, which can be furnished with a switchboard, each contact point representing a kiln, should be installed near the kilns, preferably in the burners' office.

This switchboard is especially constructed, so that a rotary handle makes the contact with the switch points, throwing into circuit each thermo-couple in rapid succession.

To secure this minimum amount of pyrometer equipment

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*Paper read before Canadian National Clay Products Association Convention by J. P. Goheen, of Brown Instrument Company, Philadelphia, Pa.

one recording pyrometer will often suffice, equipped with a switchboard similar to that supplied with the indicator, so that any one kiln can be recorded. If a record of all kilns under fire is desired, which, of course, is best, an equal number of recorders can be used, and by similar switch arrangement can be connected to an equal number of kilns.

A pad of kiln record blanks is provided, and frequently a blackboard. On this blackboard a notation is made of the kilns under fire and just what temperatures should be attained at definite periods of the burn. This serves advance notice to the firemen just how the kilns should be fired, and no excuse can be offered that they were not instructed just what to do. In addition, the temperatures are put down on the kiln record sheet.

A recording pyrometer is also operating in the superintendent's office, so that when a record is turned in by the burner the temperatures can carefully be checked and compared. The recording pyrometer immediately shows up any laxity on the part of the burner's force, as it is only natural that men get careless unless they know that a check is kept on them.

In first burning with a pyrometer, a recording instrument is almost necessary. It will show all the small increases and decreases in the temperature curve of the kiln. It is important at first to secure a record of the kiln which has produced the best results, and this information can be used for future guidance.

This "Best Record" should show as nearly as possible ideal kiln conditions. This curve should show a gradual and steady increase of temperature. If there have been any setbacks these should, of course, be straightened out at the very next burn, if possible. A falling off of temperature means a sacrifice of all three elements of efficiency—labor, fuel and time.

The principal points to keep before you in order to secure results are as follows:

Method of firing furnaces.
Cleaning and clinkering.
Drafts.
Best coal to use.

In ascertaining the time of firing intervals much importance must be paid to the drafts. The drafts must be regulated so that enough oxygen is supplied to the fuel bed to make good combustion. It must also carry this heat inside the kiln. Again, it must not be so strong that it exhausts the fuel bed, thus sending more heat through the kiln and up the stack than is necessary. A simple form of draft gauge attached to each kiln will furnish this information.

The grade of coal used is also of great importance and depends greatly upon plant conditions. No set rule can be applied. At some plants run of mine can be used, while at others only the best lump coal will produce good firing. There is no question, however, that the purer the coal the more heat units are secured. Your pyrometers, however, can readily prove which coal produces the most heat under working conditions, pound for pound.

It has been proven that twice as much fuel is needed to bring the kilns back to proper temperature than if it had been properly fired. A setback also prolongs the duration of the burning time of a kiln, necessarily increasing the cost of labor in firing the kiln and amount of fuel used. Smoothing out these wrinkles has resulted in shortening the time of burns by hours, and even days.

The coal consumption also varies almost directly with the number of hours the kiln is burning, and a large percentage of saving in fuel is secured by shortening the time of the burn. If clinkers are allowed to form the temperature drops rapidly, and a chart shows up the trouble just as surely as a clock does the time of the day. In cleaning the fires care should be taken not to let the kiln temperatures drop. This is especially true if clinkers have formed, as often practically a new fire has to be built up. The rate of firing of your kilns can be clearly established, as overfiring will soon produce a heavy fire, which, if given the required draft for proper combustion, would soon cause the kiln temperature to increase too rapidly, with very serious results.

How many plant managers have come down to the plant in the morning and found that a burning kiln had not come along as fast nor as well as expected, and you have wondered why, and began to inquire for the reason, and perhaps imagined, often rightly, that the burner had slept on the job and allowed the fire to go down or nearly out, but you were not quite sure enough to call him down. Could he have gone to sleep with the knowledge that a recorder, perhaps hundreds of feet away, under lock and key, was making a record of his operations?

Mr. F. D. Harger, efficiency expert, recently stated, when asked for his opinion of the clay business, as follows:

"The total absence of economical methods, the utterly crude construction of even modern kilns, with their patched-up fire boxes, and iron rods as grates, the guessing of the temperatures of the kiln during the burning process, often accomplished by a simple laborer, with the only means, that of his vision, and perhaps a little experience in guessing from the color of the fire within, just what temperature is attained, and fearful waste of heat going up the stacks, is most appalling, and all plants should carefully consider means to remedy the conditions."

To summarize: What, then, are some of the practical results that can be secured by the use of pyrometers?

A Glimpse of the Kilns of the Metropolitan Paving Brick Co.

1. Uniform temperature can be maintained in the kilns, which is absolutely impossible without pyrometers.
2. The burner can operate his kilns more carefully by having at his command a known source of information as to his temperature.
3. The continuous record of the temperature carried on each kiln for the entire 24 hours each day for the entire burn proves to the manager that the kilns have been properly fired throughout the entire period.
4. The saving of fuel by eliminating uneven firing during the burn.
5. Increasing the efficiency of the men firing the kilns throughout that plant.
6. Securing a greater percentage of "first quality" ware.

Of all these six reasons for using pyrometers, the most important is unquestionably the last:

"The increase in per cent of well-burned ware."

This is the final result of all the several processes of manufacturing. If the percentage can be raised only 5 to 10 per cent, the added value to the product makes a pyrometer equipment a paying investment without considering the other five reasons. This is especially true when making face brick, where delicate and uniform shades are desired; paving block, where uniform hardness and shade are required, and sewer pipe, which is readily damaged by varying kiln conditions.

There is no doubt that the increased efficiency secured by the use of pyrometers in controlling kiln temperatures has accomplished more than anything else in the last few years in making many plants show a profit instead of a loss.

Pyrometer manufacturers have endeavored to meet the severe conditions that are encountered in equipping clayworking plants. They must, however, look to the clayworker for co-operation to secure results. It is deeply to the interest of the clay manufacturer to have his pyrometer equipment produce the best results. A great deal depends on the amount of real study and attention given to the pyrometer equipment. A pyrometer will not burn your kilns for you, but will give you the vital information from which you can intelligently operate your kilns.

Written for The Clay-Worker.

HEARD IN NEW ENGLAND.

THE CLAREMONT (N. H.) BRICK COMPANY has been incorporated, with a capital stock of $250,000, and will immediately begin the organization of a brick plant near West Claremont. The deposit from which the firm will draw its raw material covers thirty-five acres and the stratum of clay is seventy-five feet thick. The plant will be near the Concord and Claremont Railroad, which connects with the main line of the Connecticut River road, a north and south line which runs through all the larger cities and towns of southern Vermont and western Massachusetts, furnishing unexcelled shipping facilities. Power is near and abundant. Altogether, it is an ideal place for a brick plant and will be able to produce an excellent quality of common brick at low manufacturing cost.

Dyer Brothers, of Greenfield, Mass., did an excellent business in 1916 and closed up in the fall with every brick sold. They have so many orders ahead now that it will require some time after the plant opens next season to get them out. Realizing the fact that growth is certain in the future, they are preparing to install another brick machine, which will largely increase their capacity for next season. Greenfield has developed very rapidly during the past two or three years and is now destined to even larger growth in the next year or two. It is the junction of two main lines of railroad and the center of a great manufacturing district, so that brick is a very desirable commodity at present. Dyer Brothers have a bank of excellent clay and their plant is located near the railroad, so they use a siding that runs directly into their yards.

All the Massachusetts plants are closed now and shipments are over until next season. One thing which will worry consumers is the fact that almost nothing is left for the beginning of next season. Until the first burnings are ready for delivery next spring it will be impossible to do much for those who want brick. The fact that building operations were so good last year leads makers to think they will have another equally good business next season. And they are planning accordingly.

Vermont brickmakers, in a general way, are planning for increased output this coming season, to keep pace with the heavier demand expected as a result of the building boom which struck the state two years ago and has continued unabated up to the closing of the season last fall. Even in this heavily timbered state it is expensive to build anything of wood, and what is worse, insurance companies add to the cost by charging higher insurance upon wood structures. The result is that builders have arrived at the conclusion that brick must be used instead. Cement has never gained much headway in Vermont, partly, perhaps, because of the severe winters which cause the moisture in it to freeze and bring a great deal of trouble to builders. Some plants are reported to be contemplating improvements and all are looking forward to increasing their output if they can overcome the labor difficulties which beset them this past year.

Connecticut brick plants, like the North Haven Brick Company and the Stiles Brick Company, at North Haven, have always burned their brick with wood, in common with all New England brick plants. But wood is becoming scarce and high and some of them are contemplating introducing coal in its place. The familiar long woodpiles are scattered about practically all the New England yards still, but not all are situated so they feel as though they could burn with coal instead of wood. However, the cost of wood is increasing so fast in some localities that a change will be forced before very long and these Connecticut firms are likely to be among the first to make the change. They are favorably situated to obtain coal, as compared with some of the others, and for that reason the innovation is quite likely to begin there.

HIRAM.

DU PONT COMPANY HAS COMPLETED ROAD BUILDING FILM.

Much has been said and written relative to the building and improvement of roads, but the latest means taken to further the educational side of road construction and maintenance is a road building moving picture film, made at a considerable expense by the direction of the Du Pont Company, of Wilmington, Del. This firm has always manifested a great interest in all public movements from which the people reap a benefit.

This film, taken from actual construction scenes, shows the very latest up-to-date road building methods and will surely fulfill its object, the education of the general public.

The plans are to have it shown at the meetings of farmers, road builders, automobile associations and other gatherings when it can best be seen by those most directly interested in roads.

In brief, this film shows the troubles from bad drainage and mud, and how these troubles are corrected; the troubles and dangers from boulders and stumps in and near the road, and how to get rid of them; objections to heavy grades; easier and quicker methods of grading stone crushing and hauling; building several kinds of roads; repairing a dirt road! re-surfacing worn-out roads; and, finally, a completed road affording fast, easy travel.

The completed film is in two reels of about one thousand feet each, and requires about thirty-five minutes for showing. It makes an attractive, interesting and instructive addition to any convention. The demand for it is already large and is still increasing, which shows that those interested are eager to learn, or know more, so as to enable them to talk and work intelligently on road subjects, thus lending their co-operation and aid for the upbuilding and progress of the whole nation, for improved roads are merely an indication of how progressive a community really is.

Might Be Worse.

"The truest Philosopher," says Jerome K. Jerome, "I ever heard of was a woman. She was brought into a London hospital, suffering from a poisoned leg. The house surgeon made a hurried examination. He was a man of blunt speech.

" 'It will have to come off,' he told her.

" 'What, not all of it?'

" 'The whole of it, I am sorry to say,' growled the house surgeon.

" 'Nothing else for it?'

" 'No other chance for you whatever,' explained the house surgeon.

" Ah, well, thank heavens, it's not my 'ead,' observed the lady."—Weekly Telegraph.

Expected.

Traveler—Isn't this train pretty late?

Station Master—Yes, she is a bit behind, mister, but we're expectin' her every hour, now.—Harper's Magazine.

RECORD OF THE VARIOUS CONVENTIONS OF CLAYWORKERS

Interesting Proceedings of the Annual Meetings of Wisconsin, Northwestern, Canadian, Iowa and Nebraska Associations

THE SEVENTEENTH annual convention of the Wisconsin Clay Manufacturers' Association was held in the Republican House, Milwaukee, February 1 and 2. A most interesting program had been arranged but for some unaccountable reason the attendance was small. Of the eighty clay product manufacturers in Wisconsin only about twenty were present. It was bitter cold, the thermometer registering 16 degrees below zero, which perhaps is an explanation why some were absent. All the delegates present were enthusiastic, wide awake fellows who realize the full importance of these meetings and would not fail to attend same for many times the small expense incurred. A number of excellent papers were read and there was not a dull moment during the crowded two days.

Thursday afternoon, February 1, the convention was called to order by President Hilker, who made an interesting address, reviewed business conditions, mentioned ways and means of solving the labor problem, urged co-operation in work for better freight rates, emphasized the value of associational work and suggested a more vigorous publicity campaign.

This was followed by the reports of the secretary and treasurer which showed the association to be in good financial condition. The reports of the standing committees including railway rates, publicity and legislation, were then heard after which the first speaker on the program was introduced. This was Prof. Jones of Madison, who presented an able paper on the subject, "What Standardization of Drain Tile Means to the Manufacturer." He pointed out that although everything else was rising in price drain tile was not, due he thought either to the increased efficiency of our modern machinery and equipment or the lack of proper knowledge on costs. He described the methods of getting data on pressure of overburden on tile for various depths and width of trench, and compared the strength of clay and cement tile, sighting the fact that the clay tile stood the better tests. He dwelt on particular details that the manufacturers should watch, namely, absorption test, size of wall, and the placing of the strongest tile possible under roads, gateways, etc., where greater pressure occurs. He stated that the cement interests do not want firms to manufacture cement tile unless they have a $40,000 equipment, for it needs careful attention and can not prove satisfactory when fly-by-night methods are used. This proves our contention, that if cement tile are good, they are not cheap and if they are cheap, they are not good. Blisters, if any, on clay tile should not be more than 1-5 inch in thickness or more than ½ inch in width, was a declaration of Prof. Jones.

After an extended discussion, Secretary Weidman in the absence of Mr. J. D. Pratt of Menomonie, read his splendid paper on "Relative Efficiency of Up-Draft and Down-Draft Kilns." This paper is given in full in this issue under the heading Kiln Department.

Many valuable points were brought out in the discussion the most interesting part of which was a detailed talk by Mr. F. E. Poels of Green Bay, Wis., telling of his methods of burning. This will appear in the Clay-Worker at a later date for Mr. Poels has promised to give our readers a specially prepared article for the benefit of the other manufacturers in the clay business following similar lines.

The last paper on the afternoon program was by I. M. Justice of Dayton, O., on "The Use of Producer Gas in Burning Clay Products in Periodic Kilns." This will appear in a subsequent issue of The Clay-Worker.

Thursday evening from 7 to 8 o'clock the delegates listened to talks on publicity matter, this discussion being lead by an informal talk by J. E. Randall of The Clay-Worker on the Build with Brick campaign and the best methods of promoting same locally.

The delegates spent the remainder of the evening at a vaudeville show followed by an hour's pleasant pasttime at the Schlitz Palm Garden.

Friday morning Mr. Oscar Wilson of Menomonie presented a paper on the sub, "Suggestions on Cost Accounting." This appears in another part of this issue together with uniform cost system adopted by the Illinois Clay Manufacturers' Association. Points discussed were day and piece work and the figuring of factors of depreciation.

The reports of the several committees were then made. The resolution committee made the following report.

Report of the Resolution Committee.

Mr. President and Gentlemen of the Convention:

Your committee on resolutions beg leave to present the following report for your consideration:

Whereas, we have been so well cared for by the Republican House during the several sessions of our convention, the management co-operating with the officers of our association in making this a most enjoyable convention week; therefore be it

Resolved, That this association extend to the management of the Republican House an expression of our sincere appreciation.

Whereas, the officers of this association have worked untiringly for the good of our organization, have sacrificed much time in furthering its best interests, and have done everything in their power in an endeavor to build up our organization; therefore, be it

Resolved, That we show by this means our deep sense of gratitude for the services rendered.

Whereas, this association is indebted to the gentlemen who have so ably presented papers before this convention thus adding a new fund of valuable information to our ceramic literature; therefore, be it

Resolved, That the Secretary be instructed to convey to the several gentlemen suitable expressions of our appreciation.

Whereas, there is urgent need of completing the equipment of the clay testing laboratory at the State University for the purpose of testing Wisconsin clays and the further development of our clay resources and to give a course in ceramic engineering; therefore, be it

Resolved. That the Wisconsin Clay Manufacturers' Association respectfully request the university regents to provide for the completion of the equipment of the clay testing laboratory and secure a ceramic engineer to take charge of the important work of clay testing, research work in Wisconsin clays and provide for instruction in Ceramics.

Whereas, the Wisconsin Clay Manufacturers' Association is interested in any project that will increase the demand for burned clay products and believes that the Milwaukee Home and Real Estate Show to be held in Milwaukee, April 9 to 15, 1917, given by the Milwaukee Real Estate Association is a means of getting before the people of this state the true facts regarding the superiority of our products in comparison with other building materials; therefore, be it

Resolved, That this association enthusiastically endorses this movement and will lend such aid as is compatible with its interests and safe home building in general.

Whereas, this association fully realizes the great good that can result from concerted action in boosting clay products in the state; therefore, be it

Resolved, That each and every one do all in his power to bring more forcefully to the attention of the public in Wisconsin the real facts concerning the true value of brick, tile and other burned clay products.

Whereas, cost accounting is a most vital question in the management of our several businesses and many valuable pointers can be secured through co-operation and unity of purpose in this respect; therefore, be it

Resolved, That we individually give careful attention to the items of cost, factors of depreciation, etc., and not only keep an accurate record at our plants but visit the factories of the other members, study their methods and by vision and word of mouth gain the great benefits that can be secured in so doing.

Whereas, the association is doing a most valuable work in furthering the best interests of the clay product manufacturers of Wisconsin and can be instrumental in placing our clay industry of the state on a more substantial foundation; therefore, be it

Resolved, That the individual members do all in their power to create an interest in and increase the active membership of this association.

Respectfully submitted,

J. E. RANDALL, Chairman,
IRWIN FRICKE,
I. G. TOEPFERS.

The election of officers resulted as follows:

President—Oscar Zimbal, Sheboygan.
Vice President—Oscar Wilson, Menomonie.
Secretary—Samuel Weideman, Madison.
Treasurer—F. E. Poels, Green Bay.

After the usual speeches by the newly elected officers, several matters of minor importance were disposed of before adjournment.

THE NORTHWESTERN CLAY ASSOCIATION.

THE ANNUAL gathering of the Northwestern Clay Association was held in Minneapolis, Minn., January 18 and 19, and included brick men from Minnesota and the Dakotas. After the usual preliminaries, President B. Frank Pay, of Mankato, Minn., gave the president's address, reviewing conditions for the year and urging the members to give more attention to publicity of clay wares, more to co-operation with neighbors in the business. He urged regular meetings of compact groups of brick men, as often as every sixty days, to talk over conditions, and exchange views. This was recommended, even though it meant a meeting of only two or three, believing that there would be much good come from frequent gatherings of this sort. Mr. Pay's address was given careful attention and was referred to a committee.

The report of R. H. Smith, secretary and treasurer, showed the affairs of the association to be in good shape.

An interesting talk was given by J. E. Dickey, on the use of explosives in small clay banks, indicating how powder could be used to good advantage for a better preparation of the clays, and at greater economy.

J. F. Aten, of New London, O., talked for better methods and better systems of working on soft mud brick. He went into the history of brickmaking at considerable length.

Mr. Galvin, of Mason City, gave a short talk on the selling end of hollow tile, and what could be accomplished.

Prof. John T. Stewart, of the drainage engineering department of the University of Minnesota, had talk illustrated with photographs, on standard testing of drain tile. He showed the results of many crushing tests of drain tile, with the inevitable result that where equal pressure is applied to all sides of a tile, the break will be equally distributed lengthwise, breaking the tile into four pieces. These pieces will frequently arch and hold their position, in spite of the break, as is often found when taking up tile that has been in the ground for years. Where tile is subjected to freezing and thawing, unless it is not filled full of water, there is serious danger of it being broken to many pieces. Tile which has not been thoroughly burned, will scale off in layers. The matter of standard tests for tile had resulted in bringing out a great many different ideas of what constituted a proper test. The idea had been followed, to give every manufacturer a chance to demonstrate the worth of his wares under conditions which seemed to be the fairest. If a manufacturer objected to an absorption test, a freezing and thawing test was given, which was regarded as sufficient to establish their value.

The evening of the first day was devoted to the usual banquet, and entertainment accompanying. Some interesting talks were given.

The Friday morning program was opened by W. D. Richardson, of Hebron, N. D., who gave an outline talk on the subject of preheating clays, as a means of cutting down the time required to burn wares.

Prof. F. E. Grout, of the University of Minnesota, gave a talk on the clay resources of the state, based upon the researches of the geological department of the university. He told of the different clays existing in the state, and of their characteristics, their advantages and disadvantages.

F. B. Martin, of Minneapolis, reported the situation with reference to the competition for moderate priced brick houses, for which funds were raised a year ago. Five sets of plans for moderate priced brick houses were selected as prize winners by the Minnesota State Art Commission's Committee on awards. These plans and specifications can be obtained from the commission at a cost of about $15. It is proposed to print on the back of the plans, a complete bill of materials required, thus enabling the plan to be figured anywhere.

An interesting comparison was reported to the meeting by E. H. Cobb, of Minneapolis, on figures on a plan for a frame house, a brick veneered house, and a brick house, all being on the same design. They were carefully figured by good contractors, and resulted in the frame house costing $4,300 and the brick one but $4,600.

An interesting talk was given by J. E. Ray, instructors in charge of bricklaying at the Stout Institute, Menomonie, Wis., in which he told of what was being done to train young men in the work of bricklaying, with good results. Mr. Ray spoke from the union standpoint, and his talk was followed by some cross-examination by several present as to whether or not the unions were not deliberately holding down the training of apprentices, with the result of diverting building which would naturally go to brick, into other materials. Mr. Ray insisted that this was not the case, but several speakers declared that it was.

The election of officers resulted in the re-election of all the old officers, as follows:

President—B. Frank Pay, Mankato, Minn.
Vice President—L. G. Rose, Minneapolis, Minn.
Secretary-Treasurer—R. H. Smith, Minneapolis, Minn.
Executive Committee—C. J. Swanson, Minneapolis, Minn.; M. C. Madsen, Hutchinson, Minn.; A. J. Voelker, Winona, Minn.; A. C. Ochs, Springfield, Minn.; Henry Hess, St. Cloud, Minn.

The following resolutions were adopted by the convention:

Whereas, the prospects for the building and other trades during 1917 seem to be unusually good, we urge upon all connected with brick and tile industries, to make the most of the situation in pushing the sale of these wares. When prospects are good seems to be the logical time to develop the business to the utmost. It is not enough to be content with the development of the business as it comes. We should push to get a share of the business which is now going to other materials.

Whereas, the need of fireproof construction was never more apparent than now, we urge upon our members to push this view with reference to the use of clay materials. We further urge that all efforts be made to impress upon insurance men that our products are not given their just treatment in connection with their safety from fire and damage either to the structure or to the contents.

Whereas, the need of more skilled artisans in bricklaying is more and more apparent, we urge upon school authorities to make provision for this trade in connection with the manual training departments throughout the country. It is too apparent that there is too much attention being given to the development of professional men, for which there can not be the demand in proportion to the need of artisans and tradesmen, and we urge upon school, high school, vocational school and university authorities to remedy the situation by providing for bricklaying and other trades.

Resolved, That we deem the start made toward furnishing plans for moderate priced residences of brick and tile construction, to be but a start and urge every brick manufacturer and dealer to spread the information broadcast that people of the Northwest may know of the plans at their disposal. We urge our members to enclose with all mail matter, leaflets touching upon this and other matters connected with our industry.

Resolved, That the thanks of the association are extended to our retiring officers for the work which they have done for our organization during the past year.

Resolved that the thanks of the association are extended to the management of the West Hotel for the many courtesies received during our convention, also to the members of the association in Minneapolis for their co-operation during the convention.

In reply to criticisms of cost figures given in its report on the pottery industry, the Bureau of Foreign and Domestic Commerce, at Washington, offers to "show" any one interested and invites potters to come in person or send some representatives, who will be given access to all the data from which the pottery report was made up.

CANADIAN CLAY PRODUCTS MANUFACTURERS MEET AT HAMILTON.

THE ANNUAL convention of the Canadian Clay Products Manufacturers' Association which was held at Hamilton, Ontario, Can., January 23, 24 and 25, was well attended, and the excellent program which had been arranged was carried out in every detail.

The convention was opened with prayer by Rev. Drummond, which was followed by addresses of welcome by Mayor Booker and Mr. Ryland H. New. These were responded to by C. A. Millar, Inspector of Clay Products Plants, and Mr. William Burgess.

The President J. E. Frid, in his address, reviewed the work of the association and suggested ways and means of improving conditions. A. F. Greaves-Walker, Chairman of the Technical Education Committee pointed out that with the exception of a repress, the Ceramic Laboratory of the Toronto Technical School was ready for students, and that courses would be started at the end of the war.

All of the papers read before the convention were high grade and of unusual interest to the manufacturers, and included the following: "Success of a One-Horse Tile Yard," by Jack Miner; "Clays Around Hamilton and the Products Made From Them," by Joseph Keele; "Clays of Saskatchewan," by N. B. Davis; "Use of Producer Gas in Down-Draft Kilns," by A. F. Greaves-Walker; "Brick Manufacture," by William Loomis; "Clay Products in Engineering Construction," by E. H. Darling; "Labor Saving Devices in Soft Mud Brick Plants," by J. F. Aten; "Industrial Training in the Industries," by George Sprague; and two papers on "Pyrometers," one by James De Von, the Toronto representative of the Thwing Instrument Company of Philadelphia, and the other by J. P. Goheen, of the Brown Pyrometer Company, of Philadelphia.

A Question Box conducted by A. F. Greaves-Walker, was one of the most interesting features, many valuable points being brought out in the lively discussions of live topics.

A treat was afforded the delegates Tuesday evening when Jack Miner, of Kingsville, a tile manufacturer and widely known naturalist of Kingsville, Ont., gave an address on "The Value of our Wild Birds," which was illustrated by moving pictures. The large convention hall with gallery, in the

A. F. Greaves-Walker, Toronto, Ontario.

Thos. J. Kennedy, Swansea, Ontario.

J. E. Frid, Hamilton, Ontario.

Royal Connaught Hotel was crowded to the doors, and Mr. Miner held the interest of his audience for an hour and a half. Following his address, a collection of $108 was taken for the Canadian Red Cross.

A banquet was held Wednesday evening at which W. H. Cooper presided as toastmaster. Among the speakers were Mayor Booker, Major Walters, Hon. Justice Riddell, Rev. W. H. Sedgwick and Millard F. Gibson, all of whom spoke along more or less patriotic lines, but Justice Riddell made a foreceful plea to all Canadians to do their full share in the terrible conflict across the water.

The election of officers resulted as follows:

President—A. F. Greaves-Walker, Toronto.

First Vice President—Thomas Kennedy, Swansea.

Second Vice President—William Burgess, Todmorden.

Third Vice President—Ryland H. New, Hamilton.

Secretary-Treasurer—Gordon C. Keith, Toronto.

Councillors—C. B. Lewis, Toronto; Gordon C. Keith, Toronto; John S. McCannell, Milton; D. A. Lochrie, Toronto; D. A. Lochrie, Toronto; Herbert Desjadiens, Montreal; C. A. Millar, Toronto; Walter Clark Corunna; G. A. German, Toronto, and T. H. Graham, Inglewood.

A special vote of thanks was tendered Messrs Frid and New for their splendid work in handling the details which resulted in such a successful convention.

A number of ladies were in attendance, and were entertained by a committee of Hamilton ladies.

REVIEW OF THE CONVENTION OF THE IOWA CLAY PRODUCTS MANUFACTURERS' ASSOCIATION.

THE thirty-sixth annual convention of the Iowa Clay Products Mfrs. Association was held at Ames, January 16 to 18, in connection with the annual Clayworkers Institute staged at the Iowa State College. The institute program began on Monday, January 15, and extended through the 20th. The laboratory work began Monday and was completed at the end of the week. This included physical, chemical and burning tests of raw material and physical tests of burned clay products. Each man who so desired was allowed to test his own clays sent there for that purpose. The college ceramic engineering laboratories had ample facilities for making a large number of tests and the instructors, Profs. Beyers and Staley, of the ceramic department, ably assisted by Prof. Bleininger and Prof. Williams, of the United States Bureau of Standards, were present throughout the course to give instruction and to confer privately with those in attendance who wanted information regarding vexing ceramics engineering problems. The course was well attended as was the convention, nearly a hundred clay products manufacturers being present.

The convention was opened Tuesday, January 16, with an address of welcome by Raymond A. Pearson, president of the Iowa State College. This was responded to by B. C. Keeler, president of the association. Four interesting papers were read at the first session, namely, Plasticity and its Measurements, by Prof. A. V. Bleininger; Co-operative Work Among Iowa Clay Products Manufacturers, by M. L. King; How to Make a Dryer Dry, by Prof. Homer F. Staley, and Radiated Heat and Waste Heat Dryers, by I. M. Justice.

Tuesday evening the installation of the Ames student section of the American Ceramic Society, occurred, followed by a six-reel movie, showing the manufacture and uses of clay products.

At the Wednesday morning session, the following papers were read and discussed: Modern Methods of Clay Testing, by Prof. A. E. Williams; Reaching the Small Customer, by Frank Armstrong; Specifications for Brick, by Prof. A. V. Bleininger; The High Cost of Ignorance and Some Observations on Cost Accounting, by Dwight T. Farnham; Why Clay Plants Lose Money, by E. A. Hultz, and Fireproof Qualities of Clay Products, by W. C. Robinson.

An informal smoker was held at Hotel Sheldon-Munn, Wednesday evening.

Thursday the following papers were presented: Power Shovels for Clay Handling, by D. D. Deeds; Facts and Figures of Dragline Excavators, by I. E. Burkett; The Efficiency Records of the Steam Shovel in Digging Clay, by A. F. King; Pyrometers Applied to Ceramic Kilns, by R. W. Newcomb; The Use of Pyrometers in the Ceramic Industry, by I. W. Lazear; ; The Use of Pyrometers in Burning Clay Wares, by C. B. Thwing; Producer Gas and the Continuous Kiln, by W. D. Richardson; Producer Gas for Periodic Kilns, by I. M. Justice; Some Burning Experiences, by Dwight T. Farnham, and Control of Kilns During Burning, by Prof. A. E. Williams. The star speakers were Prof. Bleininger and Prof. Williams, of the U. S. Bureau of Standards; Dwight T. Farnham, industrial engineer of New York City, and W. C. Robinson, vice-president Underwriters Laboratories, Chicago.

The following officers were elected: President, W. J. Goodwin, of the Goodwin Brick & Tile Co., Des Moines; vice-president, H. S. Vincent, Vincent Clay Products Co., Ft. Dodge; secretary, Homer F. Staley, of Iowa State College, Ames, and treasurer, C. B. Platt, of the Platt Co., Van Meter. The convention was conceded by all present to be the most successful in the history of the Iowa Association.

CONVENTION OF NEBRASKA BRICK AND TILE ASSOCIATION.

THE SECOND annual convention of the Nebraska Brick and Tile Association was held at Lincoln, Nebraska, January 16, 17 and 18. It was well attended and those present received their full share of the benefits derived from associational work of this character. As a result of the convention the association has taken up the work of establishing a standard system of cost accounting, so that the the next quarterly meeting a comparison of costs can be made which it is believed will result in a very material improved condition in Nebraska.

They are working on the theory that if the members of the association know their costs there will be no need, nor will there be any intention of making price agreements. These facts were brought out in the discussion of the first paper on the program entitled "Accounting," by O. R. Martin, of the Department of Commerce, University of Nebraska. The discussion was led by C. B. Hutton, of Hastings, and F. G. Burnham, of York.

A luncheon was held at the Commercial Club Tuesday noon, after which the delegates went in a body to the University of Nebraska, where an interesting two hours' session was held in the testing laboratories.

Chancellor Avery, of the university, welcomed the delegates, assuring them the university was mighty glad to do anything it could to assist the brick and tile manufacturers in building up their business.

George R. Chatburn, in charge of the testing work, gave a most interesting talk followed by a demonstration of the strength of various clay products, as shown by their testing machines.

Tuesday an informal dinner was served at the hotel, during which the delegates discussed further the topic of uniform cost accounting and clay testing.

At the business meeting Wednesday the members became very enthusiastic over the things that had been accomplished by the association and raised the assessment per member to three cents per thousand brick sold, payable quarterly. The first year they paid in on a basis of one cent per thousand brick sold, and the second year two cents per thousand brick sold. The money raised in this way is to be used in publicity work. Prof. I. D. Wood, of the Extension service of the university, gave a practical talk on drain tile, followed by Prof. H. J. Young who brought out many valuable points which, if printed, would make good sales literature.

Wednesday afternoon, the session was held in the museum lecture room at the university and was opened by an interesting talk by Prof. George Borrowman on Nebraska Clays, which was illustrated with test pieces showing shrinkage of the clays under different conditions and the result of heat treatment. Following the discussion on this subject, a trip was made through the museum which contains specimens possessed by no other museum in the world, for Nebraska has been very fortunate in finding within her own borders specimens of prehistoric animals many of which have been mounted.

Following the tour, Prof. Tell W. Nicollet gave a talk on "Designs in Brick and Tile," illustrating same with views of new work and new ideas recently prepared by him. The decoration for the program of the convention, a most attractive leaflet, was designed by Prof. Nicolett. This showed a conventional design of brick work.

The banquet, which occurred Wednesday evening, was a most enjoyable affair. Prof. O. W. Sjogren, of the university, together with Dick Ferguson, of the Yankee Hill Brick Co., had made some small tile about the size of a napkin ring, which were at the plates of each participant, and proved an attractive souvenir of the occasion. Secretary Ringer acted as toastmaster and introduced the several speakers in a happy manner. The chief speaker of the evening was C. V. Stout, Dean of the College of Engineering.

The first business of the Thursday morning session was the election of officers, which resulted as follows: President, B. Koehler, Geneva; vice-president, J. S. Nichols, Columbus; treasurer, C. Klose, Lincoln; secretary, Frank I. Ringer, of Lincoln. The executive committee consists of W. H. Ferguson, Lincoln; F. G. Burnham, York; C. Klose, Lincoln; A. H. Farrens, Lincoln, and J. W. Turner, Seward.

Following speeches by the newly elected officers, Prof. O. W. Sjogren gave an illustrated talk on the investigation and extension in the use of brick as Nebraska farms, touching on the work of the university in educating the farmers in the advantages of permanent building.

M. L. King, secretary of the Permanent Buildings Society of Iowa, made a splendid talk on the subject "New Ideas," dealing with fireproof construction on farms. Mr. King declared that the hollow tile hog house, designed by the engineering department of the Agricultural College, is the best one he had ever seen, and since he is thoroughly familiar with subjects of this kind, his is worthy of special note.

In the afternoon Mr. King addressed the convention, giving an illustrated talk giving in detail the work of the Iowa Permanent Building Society of Iowa which has produced such successful results.

After reports of various committees, including the report of the Committee of Resolutions, the convention adjourned.

THE ITEM OF COAL.

According to a preliminary estimate made by the Department of the Interior, the total production of coal in the United States for the calendar year 1916 approximated 600,000,000 tons. This is the biggest production on record, and notwithstanding this enormous production the price of coal soared upward at a startling rate, and many industries found it difficult to obtain a continuous supply at any price. This was because the consumption requirements of coal as well as the production have passed all previous records. The situation was complicated some by the scarcity of cars and also by a scarcity of labor at the coal mines, which has made the winter period a very trying one and has added materially to the cost of burning brick by those who use coal. It is expected that the spring and summer will bring some relief, but it is not thought that the coal item will go down to its former low level for a while at least. This means that every man buying and using coal must revise his figures on this item, for contracts being placed now to cover spring and summer requirements are at prices practically double what was paid last year. Some day coal will be cheaper again, we hope, but for the time being the only safe proposition is to figure the coal item as one playing a part in the high cost of things.

SUGGESTIONS ON COST ACCOUNTING

By Oscar Wilson, Menominie, Wis.

THE MATTER of a proper, practical and simple system of cost accounting is most essential in any manufacturing business, and is just as important to the manufacturer of clay products as that of any other line.

With the idea of having something practical and simple, meaning easily to install and readily understood, I would suggest something along the following lines:

In the first place the time roll or pay roll should be kept so the time of each man on each different class of work can be figured up separately.

The cost of manufacturing brick should be divided into four general headings, namely:

1 General, or overhead.
2. Labor and supplies.
3. Brick wheelers and setters.
4. Burners and fuel.

The general or overhead, would include the cost of

Advertising.
Insurance.
Taxes.
Office expense.
Traveling expense.
Salaries, if any outside of superintendent.
Depreciation.

Labor and supplies, would include cost of

Stripping, clay bank.

Clay, representing cost of labor getting the clay from bank to machine.

Machine crew, which would include all labor in connection with the operation of the machine and taking the green brick to the racks or dryer, as the case may be, whether it is done by cars, trucking or cabeling.

Machine repairs.

Rack and pallet repairs, or dryer repairs, as the case may be.

Kiln repairs.

Building repairs.

Engineer, Boiler fuel—These accounts not necessary if electric power is used.

Sand.
Yard expense.
Yard supplies.

Yard salary, such as superintendent's salary, etc, brick wheelers and setters, which would include cost of brick wheelers, which would represent cost of labor wheeling green brick from racks to kilns or transferring cars of green brick from dryer to kilns.

Setters, which would represent cost of setting.

Burners and fuel, which would include cost of

Burners, which would represent cost of labor of burning,

Kiln fuel, which would represent the cost of fuel.

With the cost of your labor and supplies divided up into these several headings, and your time roll so kept as to know exactly how much time of each man is put in on each class of work, one can arrive at an intelligent figure at any time when the pay roll is figured up what the total labor or supplies cost for any given period, and then divide this amount by the number of brick manufactured for that particular period will give you the cost per thousand.

Of course, the items under the heading brick wheelers and setters would have to be divided by the number of brick

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*A paper read before the Wisconsin Clay Manufacturers' Association Convention, Milwaukee, February 2.

wheeled and set in order to arrive at the actual cost per thousand instead of the number of brick manufactured, as there would be a certain number of green brick on the drying racks, or in the dryer, that had not been wheeled or set until the finishing up for the season. This is also true as regards the burners and kiln fuel. The total cost of labor for burning and the cost of kiln fuel for a given period would have to be divided by the number of bricks burned during that particular period instead of the number of brick that were manufactured or came out of the machine.

By keeping your time roll in the proper manner and the distribution of the cost of your supplies and fuel, one can easily determine the cost of your finished product per thousand.

Now the items of sorting, loading, etc., have to be taken into consideration. It is a good plan to have an account called brick sorting, and the cost of all labor sorting brick charged to this account, and another account called brick loading, and the cost of all labor loading brick charged to this account, and the total of each of these accounts to be divided by the number of brick sorted or loaded, as the case may be, will give you the exact cost of each operation per thousand. These amounts should be deducted from the average price received, which will give you the average net price per thousand received for your brick at the kilns. If there are any other expenses put on the brick after being burned, such as straw used for packing in the cars, or anything of that kind, it should be treated in the same manner as above and deducted from the average price received. When you get these figures together you can readily determine the difference between the average net price received at the kilns and the average cost per thousand, is your net profit per thousand.

Now these suggestions as to the several accounts can be further classified as to details to suit each individual case and can be carried out as far or in detail as you might desire. Other headings can be used or any changes made in this respect to suit any individual case or condition. With these headings alone, however, one can easily determine the cost of his ware at each step in the process of manufacture, and in case some particular part of the cost seems excessive it can be located and the necessary remedy applied.

Understand, please, if you have something special you want to get the cost on quickly, you can arrive at it without waiting until the pay roll is figured up complete, by simply taking from your pay roll such memorandums that are necessary, but the suggestions made here are made with the idea of carrying the amounts under each heading in the ledger until you close your books, let it be once a month, every three months or at the close of the year, as the case may be.

UNIFORM COST ACCOUNTING SYSTEM FOR ILLINOIS CLAY MANUFACTURERS.

At the thirty-eighth annual convention of the Illinois Clay Manufacturers' Association, the following cost accounting items were adopted. They were used by several of the manufacturers during 1916 with good effect.

All expenses shall be divided into three classes:

Factory Expense, General Expense, Selling Expense.

Factory Expense.

Power—Fuel, labor, supplies, repairs—used in power plant for power.

Clay—Labor, supplies—all cost of clay delivered to grinding machines.

Machine Department—Labor, supplies, repairs—all cost from grinding clay to placing ware in dryer.

Drying—Fuel, labor, repairs—used in drying.

(To get unit cost, divide each of the above items by the quantity of ware formed, less drying and burning loss—in thousands of brick, in tons for hollow ware.)

Setting—Labor, supplies—all cost from dryer to closing kiln.

(Divide by quantity of ware set, less burning loss.)

Burning—Fuel, labor, repairs on kilns—all cost of burning and cooling kiln.

(Divide by quantity of ware burned, less burning loss.)

Handling—Labor, repairs—Drawing kiln to cars, kiln to stock, rehandling—stock to cars.

(This department may be divided into either two or three divisions as shown.)

(Divide each of these items by quantity of finished ware drawn from kilns.)

General Expense.

Superintendence.

General Supplies.

Insurance.

Taxes.

Repairs and Maintenance of Buildings.

Sundry Expense—Connected with plant.

Depreciation—On clay bank, buildings, machinery and equipment.

(Divide each of the above items by quantity of finished ware drawn from kilns.)

Selling Expense.

Salaries—Of officials and general office force.

Advertising—Including traveling expenses, samples and freight and express on same.

Deductions—Claims and allowances not agreed to at the time of sale.

Interest—On borrowed money.

Sundry Expense—Including rent, telephones, etc.

(Any of the above items may be further divided, if desired.)

(Divide each of above items by total net sales [that is, total gross sales less commissions and cash discounts] in dollars—giving percentage of selling price.)

STANDING COMMITTEE ON UNIFORM COST ACCOUNTING.

D. C. Haeger, Chairman, Aurora, Ill.
A. E. Williams, Urbana, Ill.
D. F. Stevens, Danville, Ill.

HIGH-GRADE SOFT BRICK MACHINERY.

For quality and general efficiency the Potts self-striking soft mud and fire brick machine, a cut of which appears on page 208, is unsurpassed, and the same is true of their general line of brickyard supplies, disintegrators, pug mills, roller crushers, barrows, trucks, etc. Mr. George Potts will represent the firm at the N. B. M. A. convention, where he will be glad to give convincing evidence of the claims made for Potts machinery.

ARCHITECTURE AND BRICK.

Those of a prophetic nature who see visions of the future are very naturally recognizing in those visions now where they pertain to architecture that the real American architecture when it is finally evolved into distinct or distinctive form and obtains its final recognition, will be done in brick and other clay products.

Anything in architecture which attains to permanent distinction must have an element of permanency in the materials of construction itself, and there is nothing in the way of building material offering or that has been offered at any age of the world which offers more permanency than the burned clay of the present generation. Baked and burned clay, even when done in the primitive days of limited scientific knowledge and mechanical appliances, had wonderful permanence, as is attested by the fact that much of the history of the human race has been preserved and handed down by this material. Meantime we have gained a more thorough knowledge of the science of clayworking and of clay burning, and this supplemented by many mechanical devices, has made it easily practical today to produce brick and other clay products, not only much superior to those of by-gone days with which architecture has been developed in the older countries, but it is easily far superior to any other building material offered, not only in the matter of permanence but also in the elements which make for beauty.

Brick and clay products offer a wide range of color and color combinations so that all the beauty elements desired in the color line are easily obtainable. Also the units are of such a size that lend themselves readily to the development of any and all ideas of decorative detail.

There is really no room for argument on the point that American architecture will be developed in brick. The only questions requiring attention are those of detail, of ideas, and of inspiring ideals in educating the public taste. The material with which to create the architecture of the country is brick.

THE BUILD WITH BRICK SHOW PROMISES TO MEET EXPECTATIONS AND PROVE OF GREAT BENEFIT TO THE INDUSTRY.

THE EFFORT OF ROBT. C. MITCHELL, sales manager of the Barkwill-Farr Company, Cleveland, O., to forestall a disgrace upon the clay industry of the country by failure to be represented in the National Complete Building Exposition, in New York, March 5 to 11, has met with only fair response.

As usual, the enterprising clayworkers throughout the country were quick to offer their co-operation and a very large majority of them contributed the maximum suggested by Mr. Mitchel in his letter, which was $5.00. This list of contributors, Mr. Mitchell feels, constitutes the honor roll of the industry, and it is printed in full below. Whereas more than $5,000 was spent by the Ohio face brick manufacturers in the Cleveland show last year and very much larger sums have been spent in past years in the clay shows in Chicago, the fund available to make a display in New York is about $500. Mr. Mitchell is now making an effort to have this sum augmented by one or two of the New York manufacturers in a sufficient amount to make a presentable display. The show company has been most generous, also, in offering co-operation in the interest of having a proper variety of materials in the show. While the amount is small, the clayworkers who attend the show in New York unquestionably will not be ashamed of the presentation of their material.

In a recent interview with Mr. Mitchell, he was unable to conceal his disappointment at the exceedingly small number of clayworkers in the country who are awake to this opportunity for good promotion work.

"I am frank to say," remarked Mr. Mitchell, "that I do not wonder that American cities are built almost entirely of frame. The lumbermen are thoroughly alive and progressive and generous in all their publicity work. They fully deserve the preference that is given their material. They have prospered through good promotion and publicity, while the clayworkers of the country generally have simply existed. I find that some of the clayworkers, because general business prosperity has forced orders upon them, begin to feel a little independent. They evidently do not think there ever will be a slump and be-

Interior View of the Grand Central Palace, Where the Complete Building Show Will Be Held March 5 to 10.

cause at the instant their plants are busy, they see no need for doing any promotion work. It is not my policy, however, to let down the pressure at any time, and this policy has resulted in not short of being oversold constantly for the past two years.

"I regret very much that so many of the brickmakers do not have the interest of the whole at heart to a greater extent. If they had the vision to see into the future but a short time, I am certain that we would have had ten times the amount of money that we now have to give clay products their proper place in the New York show.

We are still open to subscriptions because we will need every dollar that we can get, and if there are any that have not contributed, who feel that they should do so, send checks to R. P. Stoddard, secretary of the Society Advocating Fire Elimination, 354 Leader-News Building, Cleveland."

The Everhard Co.
The Ohio Clay Co.
The Newburgh Brick & Clay Co.
The Cleveland Brick & Clay Co.
Pennsylvania Clay Club.
The Medal Paving Brick Co.
The Keim Brick & Tile Co.
National Fire Proofing Co.
Craycroft-Herrold Brick Co.
Standard Brick Manufacturing Co.
Baltimore Brick Co.
Thomas Moulding Brick Co.
The Wadsworth Brick & Tile Co.
J. J. Shepard.
The Alliance Clay Product Co.
The Richland Tile Co.
The Collingwood Brick Co.
John Ringle.
J. C. Kline.
John H. Black Co.
The Burton-Townsend Co.
Georgia-Carolina Brick Co.
Wm. A. Wallhead.
The Barkwill-Farr Co.
H. C. Carroll & Sons.
Webster & Keyser.
Dover Fire Brick Co.
Los Angeles Pressed Brick Co.
The Metropolitan Paving Brick Co.
Mason City Brick & Tile Co.
The Dunn Brick Works.
Consolidated Brick Co.
Western Brick & Supply Co.
Cary Brick Co.
Keystone Clay Products Co.
Western Brick Co.
Bessemer Limestone Co.
Wynn & Starr Co.
The Colonial Pressed Brick Co.
The Queen City Brick Co.
The Hocking Valley Fire Clay Co.
The Darlington Brick & Mining Co.
Haeger Brick & Tile Co.
Hydraulic-Press Brick Co.
Wm. H. Gifford.
Alton Brick Co.
N. P. O'Neal.
Geo. T. Dickover & Son.L. L. Stephenson. Brower & Best.
Detroit Brick Manufacturers & Dealers' Association.

THE VALUE OF CLAY.

During a somewhat lengthy discussion of cost in brick making at the annual meeting of the Illinois Clay Manufacturers' Association one of the statements made in the matter of valuing clay, or rather charging off depletion, was that an allowance of 2½ cents per ton was made for depreciation in the clay bank. This is interpreted to mean the placing of a value of 2½ cents per ton upon clay.

If there is another raw material useful to mankind which gives more ultimate value in the finished product as compared to the valuation placed upon the crude material than this we are at some loss to name it. Some day we have hopes that clay will come into its own in the way of recognized values. Meantime it is interesting to note that some short steps of progress are being made toward this goal.

Brick manufacturers who keep the costs or take into consideration the factor known as depletion, charge off regularly something to account for the volume of clay or shale being used up from their holdings. Also there is some value attached to land properties which have suitable clays and shales for brick making, a value somewhat in excess of land for agricultural purposes.

So far, however, there has not been any generally established schedule of values for clay and shale as the raw material for brick making, such, for example, as has been established for timber properties as raw material for lumber making. There is room for some good work here, a species of research work, with a view to determining what should be a rational value for an apparent given quantity of clay or shale in certain specified relations to transportation and to possible source of market for the burned product. When we once get some reasonable base established for valuing the clay or raw material for brick manufacturing we will have made quite a step forward in establishing the industry of brick making upon a more satisfactory footing.

Grand Central Palace, Home of the Complete Building Show for 1917.

Evidence Closed.

Lawyer's Wife: So your client was acquitted of murder. On what grounds?

Lawyer: Insanity. We proved that his father once spent two years in an asylum.

Wife: But he didn't, did he?

Lawyer: Yes. He was doctor there, but we had no time to bring that fact out.—New York Sun.

THE CERAMIC MANUFACTURERS' WEEK MARKED SUCCESS.

THE SECOND annual short course in ceramic engineering at Alfred, N. Y., January 23-25, was a notable success. The attendance was exactly 100 per cent. greater than last year. The interest and enthusiasm of those in attendance as well as the interesting and instructive series of lectures given combined to make the occasion not only interesting but decidedly profitable.

The course was designed to meet the needs of ceramic manufacturers in many lines, and the result was that nearly every line of ceramic manufacture was represented.

Following the course at Alfred, adjournment was taken to Corning, Friday, January 26, where the entire day was spent visiting the Steuben Glass Works, the Corning Glass Works and the Corning Brick and Terra Cotta Works. In the evening a dinner was given at the Corning Club, and this was followed by the annual business meeting of the New York State Ceramic Products Manufacturers' Association.

The results of this course not only assure the continuance of the plan, but prove that the manufacturers of the state are a unit in the support of the Ceramic School at Alfred, and are anxious to avail themselves of the benefit that is to be derived from this institution.

The lecturers on the program were the following: A. V. Bleininger, ceramist chemist, National Bureau of Standards, Pittsburgh, Pa.; C. F. Binns, director and professor of ceramic technology, New York State School of Ceramics; J. B. Shaw, assistant director and professor of ceramic engineering, New York State School of Ceramics; W. A. Titsworth, professor of physics, Alfred University; C. H. Milligan, professor of chemistry, Alfred University; F. T. Owens, Fiske & Co., Ridgway, Pa.; Grover Babcock, Ames, Iowa, and Alfred, N. Y.

THE BROWN INSTRUMENT COMPANY AT THE McALPIN.

The Brown Instrument company will have something new and interesting to show the delegates to the National convention. They will have an exhibition of pyrometers in their room at the McAlpin where they will be represented by Mr. R. P. Brown, president, John G. Goheen, sales manager; George W. Kellar, advertising manager, and J. D. Andrews, their New York representative.

THE J. D. FATE COMPANY ELECT OFFICERS.

At the recent annual meeting the J. D. Fate Company, Plymouth, O., elected the following officers for the ensuing year: President, H. S. Fate; vice president, George B. Drennan; secretary-treasurer, H. R. Sykes. The latter reports that their business for 1916 was quite satisfactory and that the prospects for 1917 are exceedingly good. They will have a full delegation at the N. B. M. A. convention, at the Hotel McAlpin, and invite all visiting brickmakers to call at their headquarters on the twelfth floor while in the Big City.

BELATED CALENDARS.

We have recently received some belated calendars which are very attractive additions to our wall decorations. One is entitled "The Mayer Girl" and comes with the compliments of the C. P. Mayer Brick Company, Bridgeville, Pa. It is a fine combination of the two most beautiful things in the world—a pretty girl and a bouquet of flowers. The calendar pad is a minor feature.

A similar offering bears the name of Arbuckle & Co., of Rushville, Ind., manufacturers of Hoosier brick and tile machines, the Powell shale planer and a general line of brick and tileyard supplies, all of which are well known to the trade. One of their large machines especially adapted to the manufacture of hollow tile is pictured on page 215.

A dainty combination of blotter and calendar comes with the compliments of Prof. H. A. Wheeler, of St. Louis. It was too pretty to be wasted on an office desk, and so was taken home for domestic use.

DEAN OF COLLEGE OF ENGINEERING RETIRES TO ENTER COMMERCIAL FIELD.

Dr. W. F. M. Goss, for many years associated with the Schools of Engineering, Purdue University, and since 1907 dean of the College of Engineering of the University of Illinois, has resigned that office, effective March 1, 1917, to assume the presidency of the Railway Car Manufacturers' Association, an office to which he was elected on February 1, subject to his release by the university authorities.

AMERICAN CERAMIC PROGRAM.

The program for the Nineteenth Annual meeting of the American Ceramic Society provides for the usual feast of technical lore, which is a part of that organization's annual diet. Forty-six papers are scheduled, embracing almost every imaginable phase of the ceramic art and industry. There will be one marked innovation. Tuesday afternoon at 2:00 p. m., the society will meet in lecture room B in the Metropolitan Museum of Art, Central park. Miss Richter, Curator Department of Classical Art, Museum Staff, will lecture on Ancient Greek Pottery. Mr. Bosch Ritz, Curator Department of Oriental Art, Museum Staff, will lecture on Chinese Porcelain. Prof. Edward Orton and Charles F. Binns will present papers, after which those in attendance will be conducted to the Departments of Ancient Greek Pottery and Chinese Porcelains in the Museum Gallery, where may be seen a collection of Greek pottery and Chinese porcelains of rare beauty.

Metropolitan Museum of Art, New York City.

For complete program, address Prof. Edward Orton, Jr., Secretary, Columbus, Ohio.

MARY'S HEN.

Mary had a speckled hen
    That was a business booster;
Every day she laid an egg—
    But at night she was a rooster.

A MEAN ADVANTAGE.

"I hear that Laura's engagement to the young minister is off."

"Why, yes, she told me. He was horribly jealous and so unfair."

"In what way was he unfair?"

"Every time she would make an engagement to go motoring with some other man he would pray for rain."—Liverpool Post.

THE FOUR CORNERS OF NEW YORK

By Benjamin De Casseres in Puck.

THE CORNERS OF NEW YORK are door-knobs that open up to the eye the long vestibule of the streets, which end, in whatever direction you follow them, at a river.

There are corners that are as quiet as thought, which point down streets that we are sure must be inhabited by students and recluses and astronomers or cabalistic brotherhoods who entertain behind closed shutters strange men from the East.

There are corners that swirl and toss with human spray—blatant corners, where the sunlight itself seems to honk honk in unison with the automobiles; a giant maze of humans, who seem literally to pass through one another in their scurry like fourth dimensional beings; corners where the human will bites and gnaws its way from gutter to gutter.

There are corners, west side, east side, that are, day and night, sentinel posts for criminals and the ferret-eyed gentry of the underworld—that vast and fascinating region of New York which has left us the only land of romance now that war has lost its glamour; that Prester John Land still breedy with tales to make the eyes pop in the telling and fill the ear with resonances of that glorious Italy of cut-throats and slit-purses; these corners have forever the finger on the lips; above the frosted glass of its four barrooms, eyes, eyes, eyes, gray eyes and black eyes—come to mere points and slits through years of peering—sweep the horizons for "drunks" and "bulls."

At the corner of Broadway and Wall, there is a giant Golden Calf. Of course you can't see it by looking; you must see it by seeing. It is built of the dreams and thoughts and instincts of the great tide of shades that beat around the reefs of brick and granite that raise their ironical heads to the sun.

Broadway and Wall is a great gout of life, a vast but compact spectacle of the Primal Instinct—the lust for the goods of the world. It is the Klondike of the East, the Golconda of the West, the trysting place of Prince Fortunatus with his bravos.

This democratic mob, that the headstones in Old Trinity look out upon in such graven irony, inspires one with the pathos of life. For in the faces of these people is the sickly fear of "being done" the foreordained despair of those who dig for gold.

There is about the corner of Broadway and Wall something of the fascination of funerals.

Fifth avenue and Twenty-third street! The Flatiron corner, where skirts never cease from troubling and the Old Adam never is at rest! Here is something of the healthy tang of life. The flow of people is healthier than down below; there is a merrier spark in the eye, more vision and less of visions; the faces here have horizons, and the Will-to-Live, if it marches with slower pace, seems surer of its tread, as though a god—or is it the goddess that floats so proudly in the air atop the old Garden?—had whispered, at this corner "Keep your eye fixed on me."

Here is a sense of the enormous, the indefatigable, the artistic, the vistas of a Parisian place. The Metropolitan Tower, the prow of the Flatiron, Diana, the sages frozen in marble that adorn a great court of justice, a church whose architecture is a memorial to pagan grandeur, a fountain that sings its buried song to the birds in the trees over its head, the fantastic beings who are trying to redeem a beautiful wayward humanity from the summit of a soapbox, the shops of Broadway that show the poor the stupidity of their poverty—why should we not call this corner, where Diana salutes the subway, the Corner of Mysterious Distances?

Humanity at this corner bears about it something of the fugacity of Eternity.

Pleasure—fundamental and primitive, lifegiving and eternal pleasure—is essentially Greek. India taught us the sublimities of thought; Greece gave us the religion of Pleasure, the superb gesture of disdain in front of the grave, the worship of Laughter and the Senses. Forty-second street and Broadway is Greek, pagan, full-blooded. It is a heart that pumps with the clangor of a hundred golden tocsins. It is the Ultima Thule of West, East, North and South. It is the corner—mad, riant, clangorous corner—of Perpetual Holidays. To "Billy Sunday" and the sacred buzzards of puritanical culture, it is Sin. To the healthy mortal, not over-moral, not too good, not too unhuman, it is the way of forgetfulness and the crossroads to pleasant memories.

Avaunt! Neros of morality and Caligulas of prudery! Here is the mountebank, the play, rich and rare wine, food that would surfeit Gargantua, laughter and song that drowns the night in its mountainous billows, puts beads and bubbles in the eye of man and woman. This corner is paved with the skulls of the brave and the bones of those who loved life well but not wisely—as the great god Pan intended us to love it.

Here on this corner, which bays and calls in a thousand directions, humanity cuts loose and sheds its idealism like a hair shirt. Freshness, expectancy and joy light up the faces after nightfall of those who tread these stones. The Great White Way is the golden shield of the people as they flee Numbskull "Thou Shalt Not" and the old hag Care. Puck and Falstaff are here on this terrace of the House of Pleasure; and Rabelais and young d'Artagnan and Petronius and Robin Hood, if you like, and Scaramouch and Thais, and Ajax Smith, billionaire lumber king from the far Northland who has come to Forty-second and Broadway in a limousine to be human and terpischorean, and so forth.

It is the corner where all roads lead to the elemental virtue—pleasure.

But still another corner. Bowery and Houston at six o'clock in the evening. This is the corner of Care. A great bat spreads its wings here—wings which shut out the stars. It is Drudgery. Humanity is going home—eastward—en masse. It is a surge of strangled sighs and laughter that rings against the iron girders of the 'L' like the fall of counterfeit quarters on wooden tables. It is the corner of the revolution, for these brains have harbored strange chimeras before they were encased in skulls.

Bowery and Houston at six in the evening is a dangerous corner. These thousands of men and women who go east bring not peace, but a sword. Those bat wings shall become wings of fire some day, and these untongued masses of flesh and blood shall begin their march toward the far Meccas of their dreams.

The Bowery and Houston is the Corner of Tomorrow.

ARBUCKLE & CO. PROSPEROUS.

The past year was a good one for Arbuckle & Co., of Rushville, Ind., manufacturers of a complete line of clayworking machinery and the Powell shale planer. They filled several nice orders and have quite a number on their books at the present time. This is one of the old clayworking machinery firms with an established reputation. Especially is their machinery adapted to the manufacture of drain tile and hollow ware. They sell a complete line of stiff mud machinery, including all equipment necessary, such as pulleys, shafting, feeders, etc. The Powell shale planer, for which they are the sole agents, is quite in demand, this machine being a most economical one for getting out the raw material and the averaging of same.

Many a time there is kicking about the work of a brick machine when the trouble is more with the manner of handling the machine than with the machine itself.

OFFICIAL ANNOUNCEMENT AND PROGRAM

Reduced Railroad Rates and How to Get Them.

One N. B. M. A. Session a Day, 10 A. M. to 1 P. M.

Entertainment Features and Meetings of the Allied Organizations.

McAlpin Hotel, Broadway, 33d and 34th Sts., March 5th to 10th, 1917.

THE THIRTY-FIRST ANNUAL CONVENTION of the National Brick Manufacturers' Association will be held in New York City, March 5 to 10, 1917. New York is now the largest city in the world and its many attractions insure a large attendance. Indeed it is predicted that a convention on Broadway will prove a record breaker in every way.

Convention Sessions Open to the Public.

All sessions of the National convention are open to the public. It will be noted that there is but one session a day —from 10:00 to 1:00—leaving all the balance of the day for the pursuit of business and pleasure as it may suit the bent of each delegate. This it is hoped will result in regular attendance at each and all of the sessions, and each and every delegate is urged to make his plans with that in view, allowing nothing to prevent prompt attendance at the regular sessions.

Reduced Railroad Rates.

The Trunk Line Association has granted reduced rates on the certificate plan on the basis of two cents a mile for the round trip. The New England Passenger Association has concurred with the proviso that certificates will be issued where they are in stock at the local ticket office, and advise delegates to make requests for certificates three days before the intended day of departure so if not on hand the certificate can be obtained from the main office.

The Central Passenger Association also concurs, but will sell round trip tickets instead of issuing certificates, so that the reduced rates will prevail in all the territory in the Eastern and Central states bordered by Buffalo, Cleveland, Chicago, Peoria, St. Louis, Cairo, Louisville, Cincinnati, Charleston, W. Va., and Washington, D. C. Those coming from points beyond this territory can use their local mileage to these gateway points and there repurchase, taking certificates where same are required, which when vised by the Secretary of the N. B. M. A., and the representative of the Trunk Line Association, will entitle the purchaser to the reduced rate returning. Tickets going may be purchased March 3, 4 and 5, and the return ticket may be purchased up to midnight of Wednesday, March 14.

Delegates from Southern States can purchase tickets at reduced rates to Washington, D. C., on account of the President's inauguration March 5, and there repurchase to New York.

Hotel McAlpin Headquarters.

The convention sessions will be held in the McAlpin Hotel. Being the largest hotel in the world, it will afford unsurpassed facilities, but owing to the expected attendance, delegates are urgently requested to write in advance, requesting reservation for the accommodations desired, stating date of intended arrival, the rate they want to pay, and the number in the party. The guest rooms in the McAlpin are on the Fourth to Twenty-second floors, inclusive, and those having a preference as to location should so signify. The rates will be $2.00 per day and upward for single room without bath; $3.00 per day and upward for double room, without bath, the rate being the same for one or two persons; $3.00 per day and upward for single room with bath; $4.00 per day and upward for double room with bath, the rate being the same for one or two persons. Where more than two persons occupy one room (separate beds) the rate will be $1.00 additional for each additional guest over the regular rate for the room.

The Hotel McAlpin is operated on the European plan, with the modification that, besides its regular a la carte service, special "fixed price" meals are served. Breakfast at 50 cents and 65 cents; luncheon at 75 cents, and dinner at $1.50. This unique arrangement enables guests who prefer to do so to limit their expenditures to a stated amount per day, with the added advantage that they are not obligated to pay for any meals they may decide to have elsewhere. In other words, this innovation possesses the merits of the old American plan, with none of its disadvantages.

Delegates will find it advantageous to occupy rooms jointly, single beds being provided where so desired, as a much lower rate is obtained that way, and a much larger number can be accommodated. The latter is an important feature, for it is anticipated there will be a record breaking attendance. Early reservations will prove advantageous. Those having special preference for any particular floor, should mention same. Some prefer to be pretty well up, others want to be near terra firma, and they will be accommodated, if they will make their wants known.

The Complete Home Show.

An unusual attraction convention week will be the Second American Complete Building Show, which will be held in the Grand Central Palace, which affords unequalled facilities for such exhibits. The show will be given under the direction of those who so successfully conducted the first show in Cleveland last winter. The co-operation of the brickmakers of the country is particularly desired, with a view of making the show of utmost value to the building brick industry.

For information as to floor space, etc., address Ralph P. Stoddard, Leader-News Building, Cleveland, Ohio. The badge of membership of the N. B. M. A. will admit all delegates and guests to the Building Show.

Convention Hall and Exhibition Room.

The sessions of the National Association will be held in the ball room of the McAlpin Hotel on the twenty-fourth floor. Space in same will be provided for the display of specimen brick, tile or other clay products, trade literature, etc., etc. Those desiring to make exhibits are requested to confer with the Secretary.

Entertainment of Ladies.

A special local committee has been appointed to provide entertainment for the visiting ladies. The latter are requested to register with the Assistant Secretary on arrival, when they will be given program of events, guest badges, etc.

Informal Reception and Smokerette.

Wednesday evening at 8 p. m., the delegates to the convention and those accompanying them, including the ladies, will be the guests of the local committee on entertainment at an informal Smokerette in the Banquet Hall of the McAlpin Hotel on the twenty-fourth floor. Being informal, the occasion will afford an opportunity for renewing old acquaintances and the interchange of social amenities. There will be various amusement features, music of a popular sort, etc.

The Annual Banquet.

The Annual Banquet or Associational Dinner will occur Thursday evening, March 8, preceded by an informal reception at 7:30 on the twenty-fourth floor of the McAlpin Hotel. Following the rule which has prevailed for several years, it will be a subscription banquet under the direction of the N. B. M. A. Executive Committee assisted by the Local Committee. A number of eloquent speakers will respond to appropriate toasts. The ladies will grace the occasion, as usual, and full evening dress will be in order, though by no means necessary.

Meeting of Affiliated Associations.

As in former years, the auxiliary organizations will meet Monday and Tuesday in the various convention halls of the McAlpin Hotel, with the exception of the American Ceramic Society, which will have headquarters at Hotel Astor. The National Paving Brick Manufacturers' Association will hold a board meeting Monday, and regular sessions Monday afternoon and Tuesday. The Hollow Tile Manufacturers' Association will hold a meeting Wednesday afternoon. The New York Paving Brick Association will have a meeting Wednesday afternoon. The Clay Machinery Manufacturers' Association will meet on call of the executive officers.

The National Building Brick Bureau.

There will be a meeting of the directors of this organization at the Secretary's headquarters, Monday, March 5, at 7:00 p. m., to be followed by other sessions, both public and executive, throughout the week. For full information as to requisite of membership, etc., address Theo. A. Randall, Secretary-Manager, Indianapolis, Ind.

Entertainment Features.

The Local Committee on Entertainment is preparing some unusual stunts for the pleasure and edification of the delegates, a special program of which will be announced from day to day, during the convention.

N. B. M. A. Program.

First Session—Wednesday, March 7, 1917. 10:00 A. M.

Opening Prayer by Rev. James B. Wasson.

Welcome to New York, by Hon. John Mitchell, Mayor of New York City, through his representative, Hon. Robert Adamson, Fire Commissioner.

Response, R. C. Burton, Zanesville, Ohio.

President's Annual Address, Charles J. Deckman, Cleveland, Ohio.

Report of the Treasurer, John W. Sibley, Birmingham, Ala.

Election of officers and members of standing committees.

Installation of officers.

Report of Committee on Technical Investigation, Prof. Edward Orton, Columbus, Ohio.

Reports of other committees.

1. "Our Fuel Problems," F. R. Kanengeiser, Bessemer, Pa.
   Discussion led by George W. D. Orr, Galesburg, Ill.
2. "The Welfare of the Industry,"
   General Discussion led by John S. Haggerty, Detroit, Mich.

Second Session—Thursday, 10:00 A. M.

3. "Economic Competition Through Associations," C. B. Platt, Van Meter, Ia.
   Discussion led by W. E. Dunwody, Macon, Ga.
4. "Properties of Structural Clay Products" (Illustrated), A. V. Bleininger, Bureau of Standards, Pittsburgh, Pa.
   Discussion led by M. E. Gregory, Corning, N. Y.
5. "Mining Clays" (Illustrated), J. H. Squiers, Agronomist, Wilmington, Dela.
   Discussion led by Wm. E. Sankey, Pittsburg, Pa.
6. "Brickmaking on the Hudson River" (Illustrated), W. K. Hammond, New York City.
7. "Brickmaking in New Jersey" (Illustrated), W. H. Taylor, New York City.
8. "Handling Brick in Large Units" (Illustrated), Christopher Steadman, Green Ridge, L. I., N. Y.

Third Session—Friday, 10:00 A. M.

9. "The Screened Shale Storage Bin; Its Use and Some of the Benefits Derived," J. P. Williams, Milton, Pa.
   Discussion led by Eben Rodgers, Alton, Ill.
10. "Beauty in Brick" (Illustrated), Prof. Charles F. Binns, New York State School of Clayworking and Ceramics, Alfred, N. Y.
    Discussion led by J. Parker B. Fiske, New York City.
11. "Brick Vitrification" (Illustrated), Arthur S. Watts, Ceramic Department, Ohio State University, Columbus, Ohio.
    Discussion led by Marion Blair, Thornton, W. Va.
12. "Brick for Paving Heavy Traffic Driveways" (Illustrated), F. A. Churchill, Conneaut, Ohio.
    Discussion led by J. W. Robb, Clinton, Ind.
13. "Brick Paving for City and Country Highways" (Illustrated), John W. Sibley, Birmingham, Ala.
    Discussion led by W. T. Blackburn, Paris, Ill.
14. "Brickmaking on the Lower Mississippi" (Illustrated), Fred Salmen, New Orleans, La.
15. "Brickmaking in the Far West" (Illustrated), W. D. Richardson, Hebron, N. D.
16. "Brickmaking the Chicago Way" (Illustrated), Frank Lambert, Chicago, Ill.
17. Report of Committee on Resolutions and Miscellaneous Business.

Questions for General Discussion.

In addition to the foregoing addresses and papers, various questions pertaining to brickyard practice will be discussed. Any member desiring information on any specific detail of the business may obtain same by submitting questions in writing to the Secretary.

New York State Paving Brick Association.

The New York Paving Brick Association will hold a meeting in the McAlpin Hotel, Tuesday at 2:30 p. m., March 6. For program, etc., address Paul Schultze, Secretary, 36 State street, Albany, N. Y.

Meeting of Hollow Tile Manufacturers.

The Hollow Tile Manufacturers' Association will hold a meeting in one of the lesser convention halls of the Hotel McAlpin Wednesday at 2:30 p. m., March 7. For further information address the President, H. H. Titsworth, Lemcke Annex, Indianapolis, Ind.

Souvenir Badge and Number Button.

An appropriate souvenir badge and number button will be presented to each member, and a guest badge to those accompanying the delegates, these being provided with the compliments of the Local Entertainment Committee. The badges will be distributed by the Secretary of the N. B. M. A., at his headquarters on the twelfth floor of the McAlpin Hotel, where all members and visitors are requested to call and register on arrival.

Those interested directly or indirectly in clay work of any character or the use of clay products of any sort are invited to join the association and participate in the proceedings of the convention. Members and their families or friends who may accompany them will be expected to participate in all the entertainments and proceedings.

Those desiring further information as to requisites of membership in the N. B. M. A., formal program etc., are requested to communicate with the secretary at Indianapolis.

THE EXECUTIVE COMMITTEE,
CHARLES J. DECKMAN, President.
THEO. A. RANDALL, Secretary.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Old Friends and Good Times.

Editor The Clay-Worker:

Enclosed please find check for $2.00 for another year with The Clay-Worker. It is a pretty good book to read, can't get along very well without it. Business was very good in 1916 and things look even better for 1917. We have made brick every day all winter except when we have been held up for coal, which is very scarce and very high.

With best wishes.

CLIPPERT, SPAULDING & CO.

Lansing, Mich.

Attention, Hollow Tile Manufacturers!

Editor The Clay-Worker:

During the period of the N. B. M. A. annual meeting, March 5-10, 1917, we feel is an opportune time to hold a meeting of the Hollow Building Tile Manufacturers' Association, and the officers have, therefore, called a meeting to be held in New York, convention hall of Hotel McAlpin, March 8, 1917.

Our association has held no meetings since last summer, and it is planned to try and organize for more active work. It is felt that our branch of the clay industry could not fail to be greatly benefited by a live, active association, and all hollow tile manufacturers who can arrange to do so are urged to attend this meeting in New York on March 8.

Assuring you that appropriate mention of this forthcoming meeting in the columns of your publication will be appreciated, we remain,

Yours very truly,
HOLLOW BUILDING TILE MNFRS.' ASS'N,
By H. H. Titsworth, President,
H. C. Downer, Secretary.

Indianapolis, February 15, 1917.

First Check of the Sreator Drain Tile Company, to Pay Subscription to The Clay-Worker.

Editor The Clay-Worker:

We are inclosing herewith check No. 1 in payment of subscription to The Clay-Worker for the year 1917. The accompanying circular is self-explanatory. Perhaps some of your readers may be interested in what we are doing here. You will note that you are getting the first check issued by the new organization. We know we will get value received many times over, for we value The Clay-Worker very highly.

Our company has purchased the immense tile factory at Streator, Ill., formerly owned and operated by the National Drain Tile Company, Terre Haute, Ind.

Streator shale is unexcelled, and as the manufacture of Streator tile and the development of the business of this factory has always been in the care of those now associated in the management, it is certain its high standard of quality will be maintained and its enviable reputation jealously guarded.

From a twelve-kiln plant, with a capacity of 1,000 carloads per year, the factory has been enlarged so that its capacity has doubled.

After a complete overhauling during the past few weeks, the new management is now able to announce the resumption of operation. We are therefore able to quote prices for spring delivery.

The benefits of tile draining are now so well understood that scarcely a land owner needs be reminded concerning them. Still, there are farmers in nearly every locality who seem to lack the initiative, even though they realize the profits which invariably follow.

It will be our policy to improve the tile whenever possible, even though it may add to the cost, as quality and permanency are more important than price.

General offices have been established at the factory, and all communications should be addressed to the company at Streator, Ill. We feel that by concentrating all our efforts at the works, better service can be rendered the trade.

STREATOR DRAIN TILE COMPANY.

Streator, Ill.

CONSTRUCTIVE PROSPERITY IN 1916.

When the Du Pont Company, of Wilmington, Del., is mentioned, many people think of explosives and war. Such is a wrong impression. True, they are the largest powder makers in the world, but the word explosives should not always be considered a destructive agency. Everybody knows explosives are used for war purposes, but they forget that they are also of great industrial benefit, being used for construction, mining, agricultural and sporting purposes.

The company is not only interested in explosives; it has put on the market numerous solvents and solutions necessary for the practical and economic manufacture of drugs, chemicals, fertilizers, adhesives, preservatives and many other such products. It is the largest manufacturer of leather substitutes in the world. Such leather is now being extensively used for automobile, furniture and railway car upholstery as well as bookbinding. During 1916 a large addition to the Newburgh, N. Y., plant was started. The scarcity of leather is working the plant night and day, and then it is not keeping up with the orders.

The Arlington Company, makers of "The Toilet Ware de Luxe" and Challenge Collars, is also owned by the Du Pont Co. The Fairfield Rubber Co., of Fairfield, Conn., was purchased in 1916 and is being operated in conjunction with the De Pont Fabrikoid Co.

All branches of the Du Pont Co. have had a great year. Its products have assisted in many great industrial undertakings and increased the farmer's wealth by helping him get more money out of Mother Earth.

One line of its business can be used as an example, that is trapshooting, "The Sport Alluring." Records show that on November 1, 1913, there were 2,668 trapshooting clubs. November 1, 1916 shows 4,119 active clubs, which indicates a splendid increase in that field. That the clubs are composed of active shooters is shown by the following: In 1913 the entries at registered tournaments numbered 17,902. In 1916 there were 24,794.

Many other instances of growth in constructive measures could be mentioned, but enough is to say that a company which started with practically naught in 1802 has by honesty, fidelity and ambition reached the top.

CHANGE OF FIRM NAME.

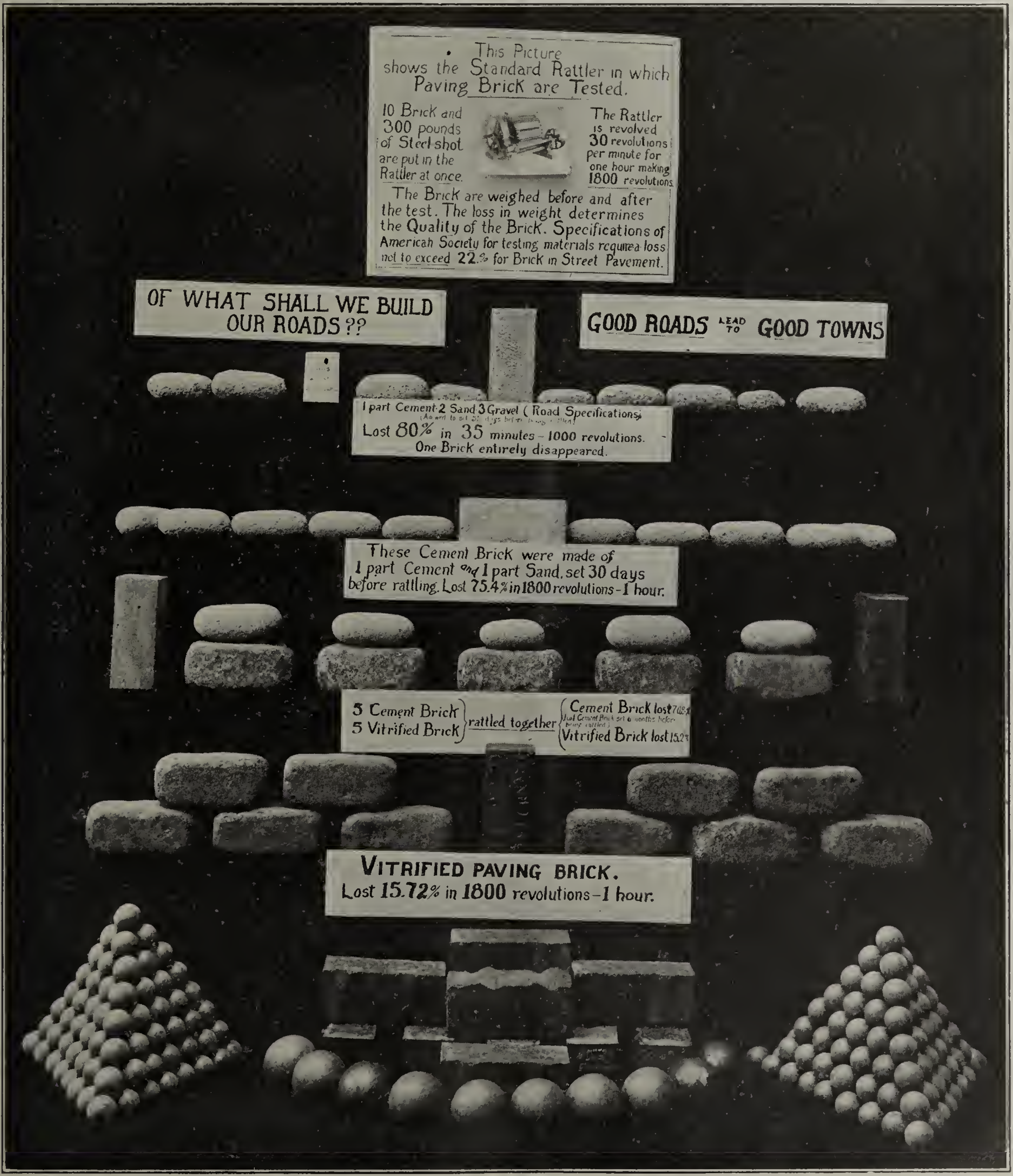
Announcement has been received of the change of name of the Queisser-Bliss Company, of Cleveland, O., to the R. L. Queisser Company, which became effective February 1. The officers of the new company, which is located in the Schofield Building, are: R. L. Queisser, president; A. H. Bedell, vice president, and E. A. Gunn, secretary and treasurer. While the company makes a specialty of burned clay building products, it handles other types of building supplies.

A TEST OF SHALE AND CEMENT BRICK

A PRACTICAL DEMONSTRATION of the superiority of vitrified clay paving brick over cement and asphalt block is graphically presented in the accompanying illustration. The test was made in conformity with the standard adopted by the American Society of Testing Materials. Ten brick are weighed and then put into a rattler such as is used by municipal testing laboratories. A number of concrete brick were made the same size as ordinary paving brick, part of them being made one part cement, two parts sand and three parts gravel, the mixture that is specified for concrete roads. The rest of the cement brick were made of one part cement and one part sand, which is a much richer mixture than is used in road work, and ought to produce a much stronger and more durable brick.

The result of the first test as shown at the top of the picture, shows the concrete brick lost 80 per cent. in 1,000 revolutions; a little over one-half of the regular test. One cement brick entirely disappeared. Had the test been continued to the full 1,800 revolutions, probably not one of the cement brick would have been left to tell the tale.

In the center of the picture is shown a concrete brick before being rattled. The second shelf shows the results of ten concrete brick of the 1 to 1 mixture. These brick lost 75.4 per cent. during the full test of 1,800 revolutions. The third shelf shows five concrete brick of 1 to 1 mixture and five vitrified shale brick put in the rattler and rattled together the same number of revolutions. When taken out together it was


This Picture shows the Standard Rattler in which Paving Brick are Tested.
10 Brick and 300 pounds of Steel shot are put in the Rattler at once.
The Rattler is revolved 30 revolutions per minute for one hour making 1800 revolutions
The Brick are weighed before and after the test. The loss in weight determines the Quality of the Brick. Specifications of American Society for testing materials require a loss not to exceed 22.% for Brick in Street Pavement.
OF WHAT SHALL WE BUILD OUR ROADS??
GOOD ROADS LEAD TO GOOD TOWNS
1 part Cement-2 Sand-3 Gravel (Road Specifications)
Lost 80% in 35 minutes - 1000 revolutions.
One Brick entirely disappeared.
These Cement Brick were made of 1 part Cement and 1 part Sand, set 30 days before rattling. Lost 75.4% in 1800 revolutions - 1 hour.
5 Cement Brick
5 Vitrified Brick
rattled together
Cement Brick lost
Vitrified Brick lost 15.2%
VITRIFIED PAVING BRICK.
Lost 15.72% in 1800 revolutions - 1 hour.

Results of a Practical Test of the Relative Merits of Shale, Brick and Cement Block. Courtesy of the Standard Brick Company, Crawfordsville, Ind.

shown that the concrete brick lost 70.8 per cent. and the vitrified shale brick lost 15.2 per cent. This is a correct demonstration of the superior quality of vitrified brick over cement block.

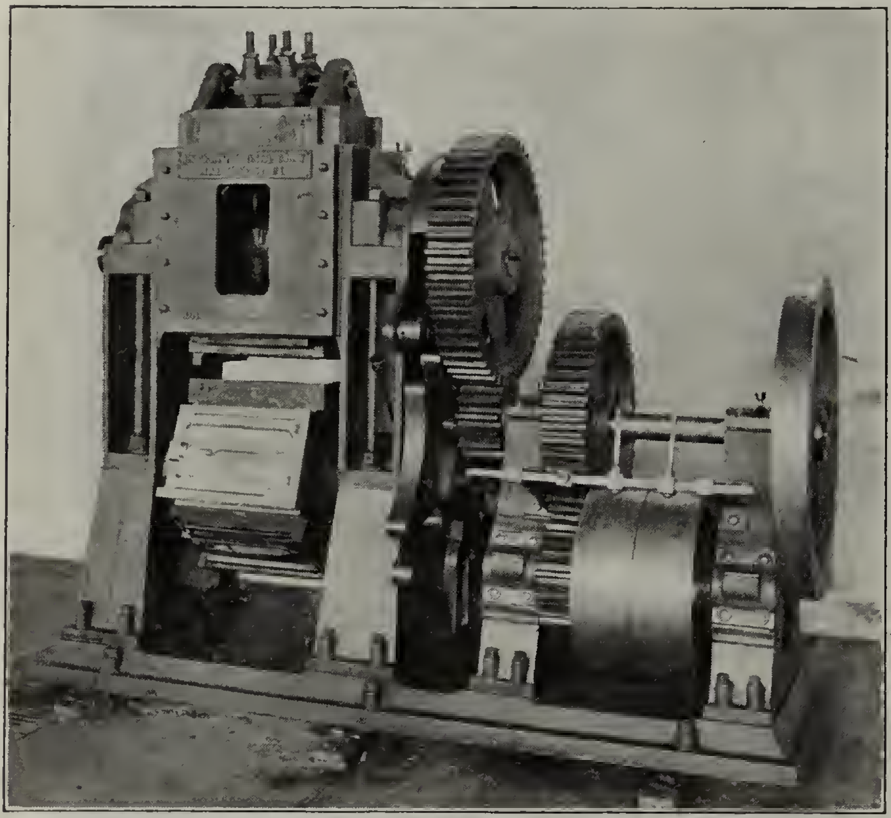
On the fourth shelf in the picture is shown ten vitrified brick after they had been rattled the full period of 1,800 revolutions, the loss being 15.72 per cent. This test demonstrates the fallacy of surfacing heavy traffic roads with concrete.

THE INTERNATIONAL CLAY MACHINERY COMPANY REPORT SATISFACTORY BUSINESS.

According to a recent letter from the International Clay Machinery Company, of Dayton, O., this youngster in the clay machinery fraternity is certainly making things hum—is certainly getting a good start with clayworkers throughout the country.

The largest of their recent sales includes a six-tunnel producer-gas-fired metallic radiation dryer to the General Insulating and Manufacturing Company, of St. Louis, Mo., and Alexandria, Ind.

A Pentagon power roofing tile press, which is shown in the accompanying illustration, has been supplied to Jose Villaverde, of Cruces, Cuba.



The Pentagon Roofing Tile Press

A complete small outfit to the Krajewski-Pesant Corporation, of Havana, Cuba.

Four International 8-foot wet pans to the Scullin Steel Company, of St. Louis, Mo.

A complete installation of an International producer-gas-fired continuous tunnel kiln to the Cuban-American Sugar Company, of Chaparra, Cuba.

A six-tunnel metallic radiation dryer to the Tar River Brick Company, of Rocky Mount, N. C.

A big order for special large dryer cars to the Clay Products Company, of Brazil, Ind.

Complete equipment or doubling the capacity of the Sun Brick Company's plant at Toronto, Ont., Can., including twenty tunnels of producer-gas-fired dryer, additional producer-gas-fired continuous kiln equipment, 240 triple-deck dryer cars, four International gas producers, and auxiliary equipment.

To top this off, they have just closed a contract for eight low-frame heavy duty pans and sixteen piano wire screens with a large Montreal firm, the name of the new company as yet being kept secret.

The International reports prospects to be exceedingly flattering, especially with reference to its producer-gas-fired dryer and producer-gas-fired continuous kiln.

GIANT KILN IS PLANNED.

What it is said will be the largest pottery kiln in the world is under construction at the Sanitary Manufacturing Company, near Kenova, O. It is to be 400 feet long, 14 feet wide and 11 feet high. It will turn out 576 pieces each day.

F. L. MANNING BECOMES GENERAL MANAGER OF THE PEEBLES PAVING BRICK COMPANY.

The Peebles Paving Brick Company, Portsmouth, O., announce that Mr. S. Coles Peebles, who has served that company as general manager for a number of years, has resigned that office and has been succeeded by Mr. F. L. Manning, their former general salesman. Mr. Peebles continues his interest in the company and will serve as vice president and director. Mr. Manning has long been a conspicuous figure in the paving brick business. He expects to attend the National Convention in New York, where his many friends can congratulate him in person.

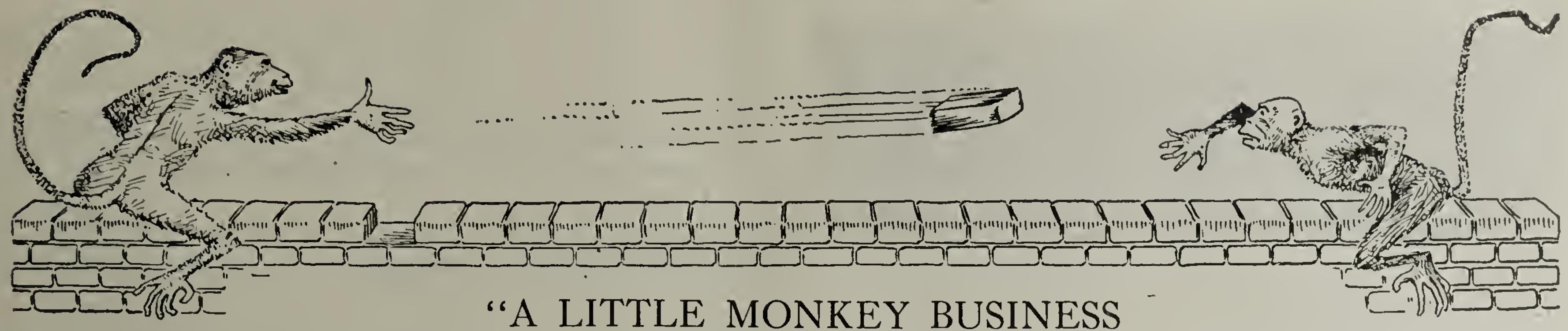
THE QUINCY CLAY AND SHALE GATHERER.

A successful machine which makes money for the owner by reducing labor bills is a joy forever, especially these times when labor is so scarce. The Quincy clay gatherer, which is illustrated on page 206 of this issue, fills the bill completely, both as a labor-saving device and for its efficiency and durability. The Gem City Press Brick Company, Quincy, Ill., bears testimony to these facts. They have been using the Quincy gatherer and plow for a number of seasons and have found it satisfactory in every way. Mr. Hummert, the manager of the G. C. P. B. Co., says he is confident that he is gathering his clay at half the amount it would cost him by any other process. With one man and a team over one hundred loads of clay, one yard to the load, are gathered per day of ten hours. Other practical brick and tile men testify in the same way as to the merits of this clever device. For further particulars address Lechtenberg Bros., manufacturers, Quincy, Ill.

MEETING OF THE TERRA COTTA MANUFACTURERS.

The National Terra Cotta Society had an interesting quarterly meeting at New Orleans January 29 and 30. Most of the leading firms in the country in that line were represented. A number of instructive papers were presented, and after considering same and the promotion work done by the society the past year, it was agreed to increase the appropriation for further publicity work. The society contemplates issuing a monthly magazine devoted to the manufacture and use of terra cotta.

An elaborate banquet was enjoyed Monday evening, Prof. Davis, of the U. S. Bureau of Standards, being the guest of honor, and, in responding to a toast, congratulated the association on the good work it had done and urged the members to persevere in their efforts to bring into general use high-grade, fire-proof building material. Fritz Wagner, who has served the society ably as an executive, declined re-election, and was succeeded by W. H. Powell, of the Atlantic Terra Cotta Company, New York City. Secretary Harry Lucas, of the Northwestern Terra Cotta Company, Chicago, was re-elected. It was agreed to hold the next meeting of the society in San Francisco.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Why.

"Why is it that truth will rise again when crushed to death?"

"Because of its elasticity, of course. Don't you know how easy it is to stretch the truth?"—Boston Transcript.

* * *

The Worst.

"Talk about torture."

"Yes."

"Nothing is worse than sitting in a barber's chair with your mouth full of lather watching the boy trying to give another customer your Panama hat."—Life.

* * *

Handy.

"Willie," said the teacher of the juvenile class, "what is the term 'etc.' used for?"

"It is used to make people believe that we know a lot more than we really do," replied the bright youngster.

* * *

Turnabout.

The doctor entered the patient's room in the morning, and, according to habit, read the chart the first thing. He was a little surprised to read:

"2 a. m. Patient very restless, nurse sleeping quietly."

* * *

Preferred.

Edith—Would you marry a man to reform him?

Alice—Not if I could possibly get a man who didn't need reforming.—Boston Transcript.

* * *

Two Periods.

He—There are two periods in a man's life when he never understands a woman.

She—Indeed! And when are they?

He—Before and after marriage.—Philadelphia Evening Ledger.

* * *

Good Place for It.

Proprietor: "What's become of the 'Post No Bills' sign that was on our fence?"

Janitor: "Someone tore it off and stuck it over the mail box, sir."

* * *

A Corporal's Guard.

Hub (during the spat)—I don't believe in parading my virtues.

Wife—I don't see how you could. It takes quite a number to make a parade.—Boston Transcript.

* * *

Religion in Colors.

The Mistress—I shall take one of the children to church with me this morning, Mary.

The General—Yes'm; which?

The Mistress—Oh, whichever will go best with my new mauve dress.

A Poor Bet.

"Mr. Redink," said the boss severely, "you got off yesterday afternoon under the plea of being sick. I saw you afterward going to the races, and you didn't appear to be at all sick."

Mr. Redink was fully equal to the occasion.

"You ought to have seen me after the second race, sir," he said.—New York Sun.

* * *

"California Elects President."

John Bosovich, late of Austria, recently applied to the Federal Court at Hammond, Ind., for citizenship papers. Clerk Hemstock put the questions and got these answers:

"Who is President of the United States?"

"Mr. Wilson."

"Who makes the laws?"

"The Congress."

"Who elects the President?"

"California."

He got his papers.—Exchange.

* * *

MICHIGAN IS DRY.

By J. P. McEvoy.

(Dedicated to the Michiganders and Michigooses.)

Little nightcap you must beat it,
  Deoch an' Doris, you must go,
Fare ye well you brimming bumper,
  B. and S. you have to blow!
Schnapps and apple-jack and brandy,
  Wines and beers a fond goodbye,
You've been kicked upon the coccyx,
  Michigan is dry!

Thomas, you and Jeremiah,
  Mighty schooners, dark and light,
All you snappy little snifters,
I must kiss you all good night!
Usubaugh, you too are fading,
  Fading, too, you rock and rye,
Nothing left to drink but chasers,
  Michigan is dry!

Water is a wondrous blessing,
  Great for washing necks and ears,
Good for sprinkling dusty pavements,
  Indispensable for piers;
Just the thing for rains and rivers,
Swell for making tea and ink,
Fine for putting under bridges,
  But it's simply h——l to drink.

Little natelopes and thirsty,
  Let us leap from bar to bar,
Let us wash our dusty whistles
  While the whistle wash is thar;
Let us leap, and, leaping, fill us,
  Then we'll lay us down to die,
For there's nothing left to live for—
  Michigan is dry!
  O, my!
  Poor Michigan is dry! —Exchange.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T, A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVII. FEBRUARY, 1917. No. 2.

CURENT COMMENT.

All aboard for Broadway.

* * *

It's the last call for the big annual doings.

* * *

The date is March 5-10, and the place, the McAlpin Hotel, New York.

* * *

Last year proved to be a fairly good building year after all, and this year promises to be a lot better.

* * *

There ought to be more brick used in 1917 than ever was used in the same period of time before. What are you doing to help make it so?

* * *

As Luke McLuke would say, what has become of the old fashioned man who argued that advertising was an expense instead of a necessity?

* * *

Almost everything taken out of the earth or produced by the soil showed remarkable increases in value last year except the stuff of which brick is made.

* * *

Moving the clock up an hour to fool ourselves into getting up and to work an hour earlier sounds consideraly like foolishnes, but quite a lot of people seem to be taking the subject seriously.

* * *

The annual net consumption of pottery in the United States is about $47,500,000 a year, and our own potteries supply above 80 per cent. of this—and export enough to almost even up the balance.

* * *

The best sermons on sobriety that have ever been produced are now being brought forward by the efficiency experts who are demonstrating that whiskey and business do not mix well together, and that it is business which suffers. While this material argument may not rank as high sentimentally as the moral argument, it is proving more effective.

* * *

It has become an established truism that nobody loves a rich man—yet everybody wants to become rich.

* * *

Speaking of things that are good for the brick industry, let us not forget that salesmanship is a factor.

* * *

Many a man who talks glibly these days of big figures and finance has a hard time to make his income cover the cost of what he considers the necessities of life.

* * *

The man who asks whether or not he ought to advertise is wasting time in the rear of the procession, for the only active questions here are, where, how and how much?

* * *

A pet hobby of Congress, which has been vetoed by presidents from Cleveland's time to Wilson, the literacy test in immigration, has finally been ridden to success—in the eyes of Congress. Just what virtue it has remains to be seen.

* * *

There is not a more useful or more widely used raw material in our natural resources than the clay and shale banks, but many others bring bigger returns. Let us seek for a price that will give dividend values to clay banks.

* * *

The mines of Arizona paid $34,000,000 in dividends last year, and when we add to this, dividends from four other states, Utah, Montana, Nevada and Idaho, the total goes above $100,000,000. Oh, for some such dividends from the clay banks of the country!

* * *

While there will be quite a lot of fanfare of bright lights and high spots at the N. B. M. A. annual, let us remember that there is a serious side, too, and much earnest and good work to be done that the occasion may be materially beneficial as well as socially enjoyable.

A GENTLE HINT FOR THOSE WHO WILL ATTEND THE N. B. M. A. CONVENTION.

The American metropolis was never quite so gay, never quite so prosperous, nor never quite so crowded with visitors as it has been this winter. All its great hotels have been turning away people daily, and many have had to go to Brooklyn and to New Jersey for lodgings. The rush incident to the winter season is nearly over; nevertheless, it is a wise precaution for those who are going to visit the city to write in advance for reservation at the hotel. That is the only way to insure satisfactory accommodations.

All who are planning to attend the N. B. M. A. convention are urged to bear this in mind and at once advise the Secretary, or the Hotel McAlpin direct, as to the character of accommodations desired, date of intended arrival, the rate they desire to pay, and the number in the party. The guest rooms of the McAlpin Hotel range from the Fourth to the Twenty-second floor inclusive, and those desiring to be on any particular floor, well up, or low down, will be accommodated if they will state their preference. A word to the wise is sufficient. DO IT NOW.

A "LIVE AND LET LIVE" IDEA.

As a sort of yuletide sermon and new year's suggestion there was set forth at some length, editorially, in The Clay-Worker for December a plea for a more active co-operation based upon the theory of living and helping others to live, rather than the old and more passive idea of living yourself and letting others alone to work out their own living basis.

A splendid application of this idea was portrayed in The

Clay-Worker for January in the reproduction of a full-page ad in which there was co-operation between half a dozen brick contractors and a brick manufacturer.

This is a live and help live idea that merits the active attention of every brick manufacturer in the country. The welfare of the business in brick laying or brick contracting and that of brick manufacturing is interwoven together in such a way that generally what helps one helps the other, and just as the booster of lumber seeks the co-operation of carpenters and the cabinet maker, so should brick manufacturers seek to build up a spirit of co-operation between themselves and those who do the work of putting the brick into structures. And do not forget that co-operation means mutual help from both sides. There is room for some splendid exploitation work during the year by proper getting together of brick manufacturers, contractors and bricklayers.

Meantime while following up this splendid idea let us not forget or overlook the original point that inspired the plea of live and help live, that of active co-operation betwen brick manufacturers themselves both in local efforts and in national effort to the end that the interests of brick may be promoted by thorough exploitation, and a fair price for the product be obtained by the elimination of ruinous competition of the cut-price variety.

A "BETTER HOMES" YEAR.

An active movement has been inaugurated to make the year 1917 a "better homes" year. The idea is to so arouse interest in home building, home improvement and the home as the basis of the greatest pleasure and happiness in the world that the year as a whole will be characterized as one in which unusual effort was directed toward better homes and a fuller appreciation of the home spirit as a dominant factor in the nation's progress.

The furniture journals were among the first to take it up, and they base their reasonings along lines something like this. The bankers have started the good work by undertaking to make the year 1917 a thrift year, manufacturers and trade journals interested in the paint business have been interested for the past two years in a "Clean-Up, Paint-Up" campaign which has led to more pride in home surroundings, and they figure that the time is here for a reaction from the automobile as a fad. The automobile has taken many a man out of his home and kept him out considerably; the moving picture show has diverted the mind as well as much money in small quantities. And now we are due for a change, partly because the time is here for a reaction, partly because an American's first love is his home and those near him who are in it, partly because many states are going dry and the traditional "poor man's club" is passing out of existence, so that a man will naturally look more to his home as the best possible place to spend his leisure hours. They figure logically, therefore, that the time is ripe for a successful, nation-wide campaign boosting the idea of better homes.

The lumber people are following suit, and every indication points toward a very active year of home building, and also of cultivating the spirit of better homes and better people through surrounding them with more desirable homes.

Surely this is a campaign in which the manufacturers of building brick can enter enthusiastically, because they have unquestionably the best home building material in the world to offer. Moreover, there is only one final, inevitable conclusion when the matter is thoroughly gone into, and that conclusion is that the way to get better homes is to Build With Brick.

There has never been a period since the first Build With Brick poster was put out and a general use of the idea among the brick manufacturers was advocated that there was a better or greater opportunity before the brick manufacturers of the country to do effective boosting for their business with a wide display of the Build With Brick slogan than right now. The campaign for making 1917 a "better homes" year should be as a battle cry to the brick boosters, and lead to a campaign of tacking up Build With Brick signs that will make the efforts which have gone before look like a feeble attempt in comparison. Co-operative action and concerted effort will do the business. What do you say about it?

MACHINERY SAFEGUARD HINTS.

The safeguarding of machinery is generally provided for by specific laws in each state, and every operator of machinery should make it his business to study the state laws in detail and see that his safeguarding precautions conform to them in every respect. Otherwise, in case of an accident there is likely to be developed the fact that the owner has failed in some respect to safeguard his machinery according to law and this puts him in bad standing in the court.

By and by it is likely that we will get these safeguard laws fairly well uniform so that there will be established general specific rules for safeguarding machinery that are substantially the same in every state. Meantime, though, no matter if some of the requirements, even some of those in your own particular state, seem foolish or unnecessary, it is important that you comply with every letter or technical feature of the law for your own safety in case of accident.

Then, law or no law, every manufacturer naturally wants to take whatever safeguards are practical against accidents and danger from machinery to men working about it. To assist in this line, not to take the place of, but to be considered along with the specific laws and requirements of each state a few pointers are given herewith as to the safeguarding of certain machinery.

All gear or cog wheels should be kept boxed in or cased in with substantial wire netting. It matters not if the gears are running in such a way as to push things out of themselves instead of drawing them in, they should be covered just the same.

Shafting not over 12 inches above the floor should be entirely boxed over.

Shafting more than 12 inches above the floor, unless entirely overhead and out of reach, say 7 or 8 feet, should be cased in or railed in so that no one may carelessly run into it.

All exposed ends of shafting should be cased in unless it is up overhead out of the way.

Where shafting is overhead some regulations require a walkway for the oiler to reach the journals. A better plan, however, where the oiling is commonly done from a ladder, is to equip journals with grease cups and make it a rule that they be attended to and the overhead oiling done either at night after the machinery stops or in the morning before it is started.

All shafting couplings and set collars should be guarded by casings, or the safety type used, with no extending nuts or screws. Even then it is better to case the couplings in.

To prevent keys from coming out of heavy pulleys and gear wheels, it is well to provide a set collar or a similar device to lock them into place.

Wherever practical, all bolts used on or about machinery should have jamb nuts to prevent working loose or else cotters in the ends of the bolts to prevent nuts from coming off.

Set screws are among the most dangerous things on pulley hubs and collars and should be countersunk wherever practical and guarded all the time.

In designing the placing of equipment, one should strive to get both shafting and belts so that they can be cased in or safeguarded easily.

Belts should be enclosed with a wire mesh or with some solid casing wherever the location is such that persons are likely to come in contact with it, that is, all belts near enough to the floor to be in reach of a man's body.

When casing in a belt enough room should be allowed for putting on and taking off and where a belt is likely to break and the flying ends do damage, extra reinforcements of safeguards should be done to protect against such damage.

In placing pulleys on a shaft one should always strive to have at least more than a width of the belt between pulleys to prevent the belt from becoming wedged and possibly pulling down the shaft.

Endless belts are always best and where splicing must be done, one should strive to eliminate ragged edges and projections because it not only makes smoother running, but also lessens the danger of catching into something.

Where belts are to be shifted on and off the pulleys a mechanical device should be provided for this purpose and also where belts are unshipped from pulleys and left idle, hooks or rests should be provided for the idle belt so that it may not ride on the shaft.

Belts should be inspected regularly and mended when they show evidence of needing it to reduce accidents from breaking belts.

Where electric transmission is used, one should study and provide all practical means for insulation to prevent shocks from the current. Also where motors are direct connected to a shaft, a cut-off switch should be provided for use in case men have occasion to work on the shaft so that they may be safeguarded against shocks.

For casing and safeguarding, the preference should be given those made of metal, either of sheet metal or wire mesh, over the use of wood, because they lessen the danger of fire from overheated journals or rubbing belts or parts of machinery and they appeal more to the insurance inspector.

In erecting safeguards around machinery, study the journals which must be reached and oiled regularly and make provision to reduce as much as possible the element of danger in oiling when machinery is in motion, and then where there still remains some element of danger, strive to use grease cups and to have them filled and the oiling done as much as possible when the machinery is at rest.

A splendid rule to have is one instructing the men to do all the oiling possible before the machinery is put into motion. Then for journals that must be oiled occasionally while in motion, provide oil cans that will reach and supply them without danger to the man using it.

TRADE LITERATURE.

The Book of Smiles for January brings the usual batch of pleasantries, and, of course, a lot of information about the Standard dryer. One page reads as follows:

> **Great-Big-Doings**
>
> **in Li'l Ol' N'Yawk!**
>
> Oh you Gay White Way!—with your "cabhoorays," your skating palaces, your midnight roofs—your Winter Gardens and your Hippodromes. List to the dirge of the solemncholy song-writer: "There's a Bro-o-ken Heart for Ev'ry Light on Broadway!" Let 'em break—we should worry. Great—big—doings at the Convention. Will you be there? **So'll we!** And willing, during business hours, to speak a few burning words about the advantages of drying brick by The Standard Natural Draft Steam System. That is, of course, if you are interested.

The little book contains several other clever skits. Write for a copy to the Standard Dry Kiln Company, 1547 McCarty street, Indianapolis, Ind.

The American Clay Magazine for February is unusually interesting. It is a veritable tabloid of trade information. It pictures a section of the Lincoln Highway, which has been paved with brick, and several other things of interest to the live wires in the industry, and oodles of information about American machinery, dryers, kilns, etc. It boosts the "Build With Brick" campaign in the accompanying clever verse. A copy of the magazine can be had for the asking. Address American Clay Machinery Company, Bucyrus, O.

Willie Is Put Wise.

Little Willie, tired of play,
Got some matches and stole away.
Soon the nice frame house near by
Disappeared in flames on high.
Willie's howls were not in glee,
'Cause they tanned his lingerie;
But, you bet, he's learned a trick—
When he builds he'll sure use brick.

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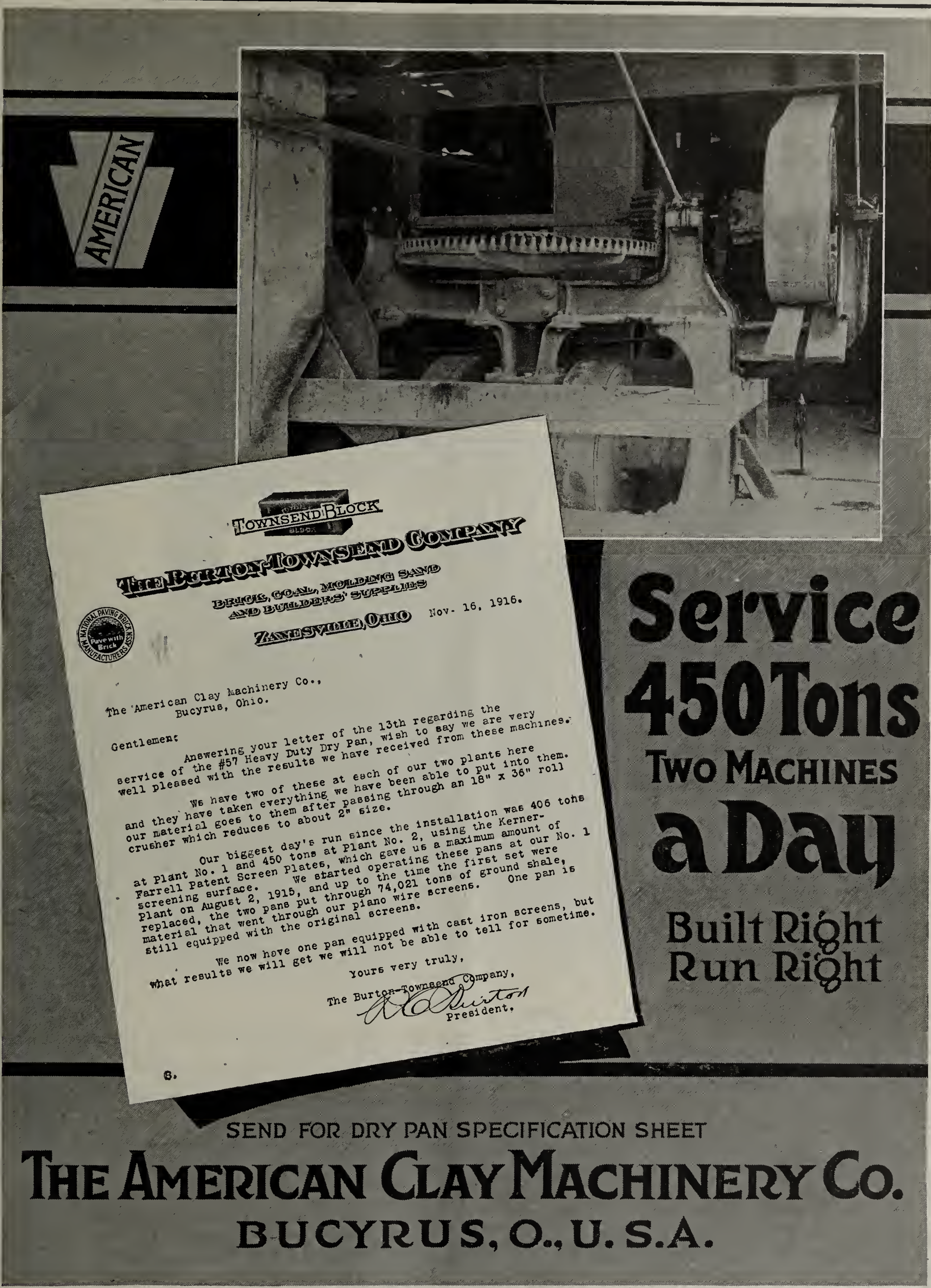
PARTNERS WANTED.

Brick and Tile Famine Exists at Detroit.

Owners of clay bank for manufacturing first class brick and tile in immediate vicinity of Detroit wish to get in touch with owners of good second hand brick machinery and who are practical brick men, under co-partner arrangement. Good railroad facilities, water and cheap labor; natural gas for burning, and plant could be operated by electricity cheaper than coal. This is a first class proposition and will show big returns. Market conditions are excellent. Address,

GEO. W. WILLIAMS,
211 Majestic Building,
1 2 dm Detroit, Mich.



TOWNSEND BLOCK

THE BURTON-TOWNSEND COMPANY
BRICK, COAL, MOLDING SAND
AND BUILDERS' SUPPLIES
ZANESVILLE, OHIO

NATIONAL PAVING BRICK MANUFACTURERS ASS'N
Pave with Brick

Nov. 16, 1916.

The American Clay Machinery Co.,
Bucyrus, Ohio.

Gentlemen:

Answering your letter of the 13th regarding the service of the #57 Heavy Duty Dry Pan, wish to say we are very well pleased with the results we have received from these machines.

We have two of these at each of our two plants here and they have taken everything we have been able to put into them. our material goes to them after passing through an 18" x 36" roll crusher which reduces to about 2" size.

Our biggest day's run since the installation was 406 tons at Plant No. 1 and 450 tons at Plant No. 2, using the Kerner-Farrell Patent Screen Plates, which gave us a maximum amount of screening surface. We started operating these pans at our No. 1 Plant on August 2, 1915, and up to the time the first set were replaced, the two pans put through 74,021 tons of ground shale, material that went through our piano wire screens. One pan is still equipped with the original screens.

We now have one pan equipped with cast iron screens, but what results we will get we will not be able to tell for sometime.

Yours very truly,
The Burton-Townsend Company,
Burton
President.

S.

Service
450 Tons
Two Machines
a Day

Built Right
Run Right

SEND FOR DRY PAN SPECIFICATION SHEET

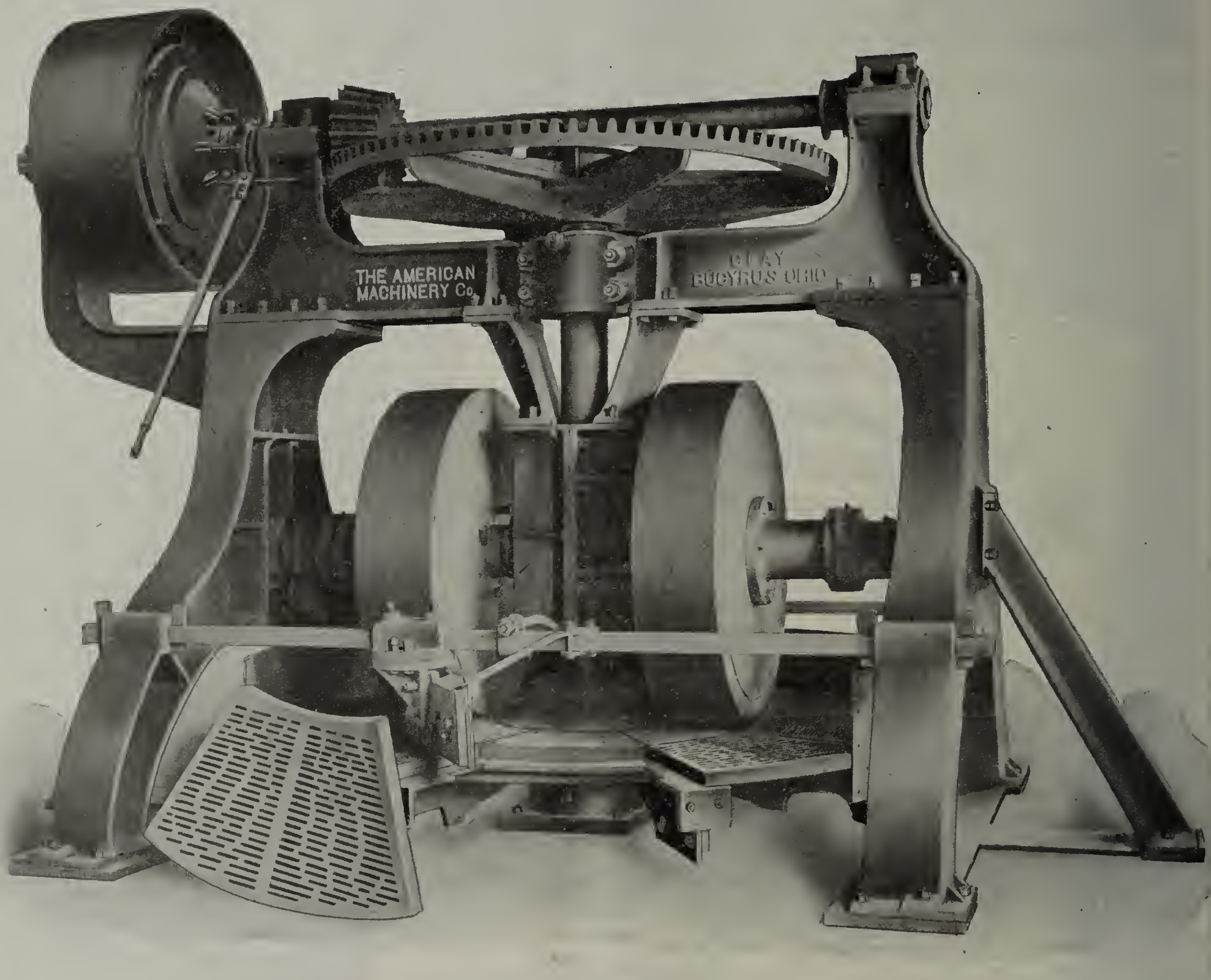
THE AMERICAN CLAY MACHINERY CO.
BUCYRUS, O., U. S. A.

A PAN WITH A RECORD

On the preceding page we print the statement of one of Ohio's leading paving brick manufacturers.

HERE ARE THE HIGH SPOTS OF THE STATEMENT

Pans run over a year without material repair. The pans "Take all the shale they can feed into them."
They are well pleased with results. Original screen plates on one pan lasted over a year.
Days run for two pans was 405 tons, and on two others, 450 tons of shale.



American No 57 Dry Pan

HERE'S WHAT GIVES THIS RECORD CAPACITY

Extra heavy construction. Great screening capacity. Correctness of design. Quality of material. Excellence of workmanship. Wear-well gear metal. Long lived step bearings. Long shaft bearings Planed joints. Lock nuts and our extensive knowledge of the requirements of a heavy pan for doing heavy work. Let us send you a full specification sheet on the No. 57 pan. We also build other pans and every machine needed by the clayworker.

The American Clay Machinery Co.

BUCYRUS, OHIO

"Look Who's Here"

LOOK AT THE PROMINENT PEOPLE USING THE AMERICAN NO. 233 AUGER MACHINE AND WHAT THEY SAY ABOUT IT:

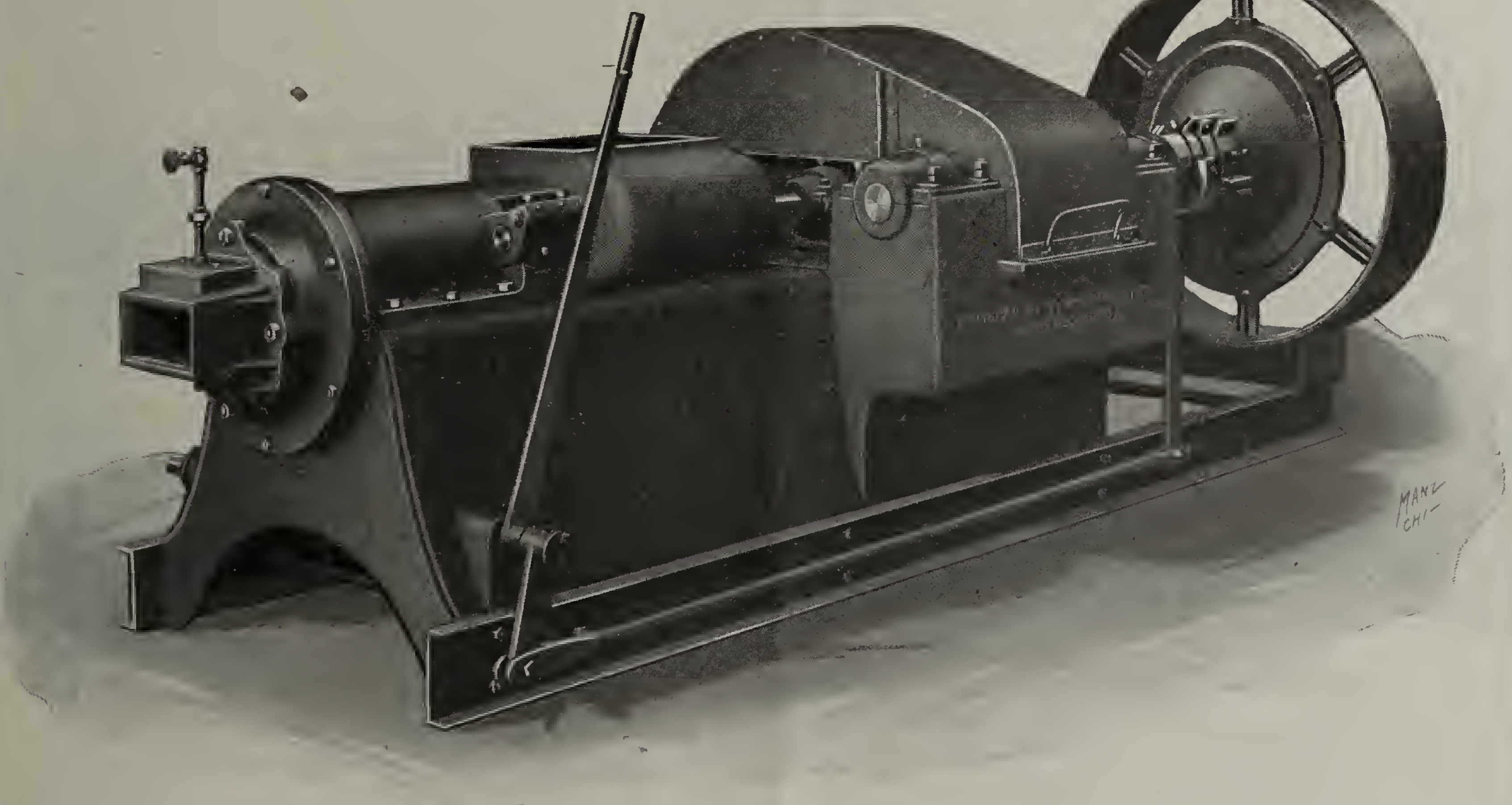
The Whitacre-Greer Fireproofing Co., says: We have nothing but praise for the American No. 233 Auger Machine.

The California Brick Company says: The American No. 233 Auger Machine is a wonder in quantity and quality of product. It gives perfect satisfaction.

The Auburn Shale Brick Company says: Your American No. 233 Auger Machine has been operating three years. It still has the original gears in good condition. It has been crowded to its capacity constantly. It is truly a marvel and its work unbelieveable.

Mr. W. E. Martin & Sons says: On your American No. 233 Auger Machine the power cost is less than on any machine we have ever used. Our only trouble is getting the product off the offbearing belt for it surely comes when you give it the clay.

WE CAN SEND YOU OTHER STATEMENTS ON THIS AND OUR OTHER AUGER MACHINES



This machine is well adapted to the manufacture of building brick, face brick, paving brick, and blocks, fire brick, medium sizes fireproofing, building blocks and drain tile.

Capacity per hour up to 7,000 standard size brick, 10 tons of fireproofing, 12 tons of drain tile or this equivalent in other wares.

The American Clay Machinery Co.

Bucyrus, Ohio.

"Living Cost?" What!!!

Why kick on the high price of Butter, Eggs, Meat and other provisions you buy?

So long as you pay twice as much as you should to burn your product you are not consistent if you complain on the cost of household items.

Suppose your cook paid these high prices for food stuff and then "THREW HALF OF IT AWAY."

That's exactly what you are doing at your plant.

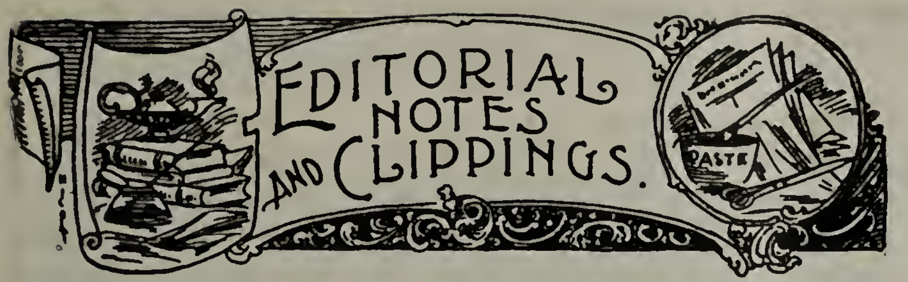
Coal costs more than it ever did and you are using twice what you need for your kilns.

Moreover we offer to save half your coal and half your kiln labor and show you how the Haigh Kiln will pay for the entire improvement in a very few years. Why not look into this economy at your "PLANT" so that you may waste a little on "GRUB and GASOLINE."

It costs nothing to get full particulars on the possibilities in your own plant for burning cheaper and better.

Let our Mr. Haigh take this up with you

The American Clay Machinery Co.
BUCYRUS, OHIO.



EDITORIAL NOTES AND CLIPPINGS.

Thomasville, Ga., is to have a new pottery, which is being promoted by women.

The Arkansas Brick and Tile Company, Malvern, Ark., will install additional machinery.

The Sand-Lime Brick Company, Greenfield, Ind., has been incorporated, with $60,000 capital stock, by Ernest L. Dobbins, Samuel D. Clayton and Charles L. Tyndall.

Additional machinery will be installed at the Rich Hill, Mo., plant of the Dickey Clay Company, which will increase the capacity of the plant to seventy tons per day.

The American Pottery Company has purchased a site at Charleston, W. Va., on which they will erect a modern pottery. L. E. Holderman, of New Lexington, will be general manager.

J. H. Donahey, A. V. Donahey and F. L. Moore, of Cleveland, O., have organized a company to manufacture clay building tile at Uhrichsville, O. The firm will be known as Donahey, Moore & Donahey.

James K. Payne, formerly with the Evans & Howard Fire Brick Company, has left that company and established an office in 2043 Railway Exchange Building, St. Louis, under the name of the Retort Clay Company.

The Staunton Clay Products Company, of Staunton, Va., recently purchased an immense tract of land at North Mountain, W. Va., on which it will erect a large plant for the manufacture of brick and other clay products.

The D. C. Shorey Brick Company, of Cincinnati, O., has recently been incorporated by Frank A. Hoiles, of Alliance, and others. This is a sales company, and will handle the products of some of the largest brick plants in the country.

Edward Wehrung, thirty years old, an employe of the Central Clay Products Company's brick plant, at North Tonawanda, N. Y., had his right hip broken and sustained other minor injuries when he was buried under an immense lump of clay.

At a recent meeting of the board of directors of the General Fire-proofing Company, of Youngstown, O., it was decided to increase the capital stock from $2,000,000 to $4,000,000. The following directors were re-elected: M. I. Arms, W. P. Arms, C. H. Booth, W. H. Foster, J. T. Harrington, H. E. White, of Youngstown, and A. P. White, of New York.

New machinery and equipment, drying sheds and other improvements are being installed in the plant of the Grand Rapids Brick Company, Grand Rapids, Mich., which was recently taken over by Chicago interests. The improvements will increase the company's old output, which was from 50,000 to 75,000, to nearly 175,000 brick daily.

A charter has been granted to the Haws Refractories Company, successor to the A. J. Haws & Sons, Ltd., and purchasers of the Haws Brick Works. The officers are: President, Harry Tredennick; vice president, Harry D. Thomas; treasurer, Campbell Patch. The new corporation will build a large silica brick plant at Lewistown of 60,000 daily capacity.

Wm. E. Dee, of Chicago, Ill., owner of the big clayworking plant at Mecca, Ind., has effected an organization which will take over the plants of the Cayuga Brick and Coal Company at Cayuga, Ind., and the Newport (Ind.) Brick Company's plant. The new concern, which will be known as the Wm. E. Dee Clay Works, has been capitalized at $150,000. Ellis E. Asbury and Glenn O. Youmans are interested with Mr. Dee.

Edward Hiller, the president of the Sibley Brick Company, of Warrior, Ala., died at his home in Birmingham, early in February, following a brief illness.

The Fort Madison Brick Company has purchased the factory of the Stockport Brick and Tile Company at Stockport, Iowa, and will put same in operation in the very near future.

Applications for a charter for the Union Coal and Clay Company, of New Galilee, Pa., has been made by Fred N. Beegle, George Davidson, Eugene S. Hoopes, Phillip T. Davidson and Harry R. Beegle.

The North American Brick and Clay Products Company of Mansfield, Ohio, has been incorporated, with $300,000 capital. B. J. Colwell, W. W. Sharp, H. K. Beck, J. B. Lindley and J. Harvey Craig are interested.

The Stevens Pressed Brick Compnay, Cincinnati, O., has been incorporated, with $25,000 capital, by Arthur W. Murray, Sr., Arthur W. Murray, Jr., Frement C. Stevens, Oda J. Stevens and Clarence E. McMullin.

M. G. McNaughton, 62 years old, superintendent of the Federal penitentiary brick plant, Leavenworth, Kansas for the last eighteen years, died recently at his home, 1104 Ottawa street, after a very brief illness. Death was caused by heart trouble. A wife, two sons and a daughter survive.

The Southern Refractories Company, controlled by the Pennsylvania and Kentucky Fire Brick Company of Bolivar, Pa., will be organized with a capital stock of $150,000. It has acquired plants at Mission Ridge, Ga., and Fort Payne, Ala. The latter place will be its Southern headquarters.

The Claremont Brick Company of Claremont, N. H., has filed articles of incorporation. The incorporators are Charles V. Paddock, Oscar B. Rand, Roy D. Hunter, A. E. Paddock, Claremont; Charles Thrasher, F. W. Blanchard, Ascutneyville, Vt.; A. Fullerton Phillips, J. H. Kinery, F. L. Cabot, Windsor, Vt. The company is capitalized at $25,000.

Earnings of the Illinois Brick Company, Chicago, for the year ended December 31, 1916, amount to about 14 per cent. on the outstanding capital stock. According to President William Schlake, the company is now free from debt, except current obligations incident to the running of the business, and the cash holdings have greatly increased, while accounts payable have been materially reduced.

At the recent annual meeting of the stockholders of the Purington Paving Brick Company, Galesburg, Ill., the following officers were elected: President and treasurer, F. G. Matteson; vice-president, George C. Prussing; secretary, W. H. Terwilliger; general manager, William G. D. Orr. Mr. Orr and Mr. Prussing, together with George P. Hoover and W. E. Phillips, were elected to the directorate. A prosperous year was reported for 1916, with good prospects for 1917.

At the "Made in Montgomery" show, at Montgomery, Ala., both the Jenkins Brick Company and the Excelsior Brick Company, of Montgomery, had very creditable exhibits, which served the purpose of attracting the visitors to the show. The sign, "Build With Brick," was a prominent feature of the exhibits. The Jenkins Brick Company's display, which was arranged by J. M. Jenkins, Jr., included an artistic mantel constructed of rough texture brick, which was much admired by all visitors.

The McRoy Clay Works, of Brazil, Ind., announced Saturday, February 3, that they had voluntarily increased the pay of their employes 25 cents a day, dating the raise back to January 20, and in addition to same had worked out a bonus system which would further increase the pay. This is the fourth plant in Brazil to adopt the bonus system within the last few years, and includes the Brazil Clay Company, the

Clay Products Company and the Brazil Hollow Brick and Tile Company.

The plant of the Central Refractories Company at Olive Hill, Ky., will double its capacity.

The Ringle Brick Company, of Wausau, Wis., will increase the capacity of its plant.

The Wadsworth Brick and Tile Company, Wadsworth, Ohio, has increased its capital stock from $75,000 to $200,000.

The Harris Manufacturing Company, of Johnson City, Tenn., would like to correspond with manufacturers of machinery for preparing clay for paint making.

The Hawkeye Face Brick Company of Des Moines, Iowa, capitalized at $10,000, has filed articles of incorporation with the county recorder. Directors are B. W. Ballou, Buffville, Kansas, H. F. Graefe, W. H. Brecht, Fred P. Carr and W. C. Strock.

A deal was closed recently whereby the Clay Products Company, of Brazil and Indianapolis, Ind., took over the property of the Brazil Face Brick Company at Brazil. The plant will be equipped with machinery for the manufacture of hollow building tile.

The Rose Hill Brick Company, of Boonspath, Va., has been incorporated with $75,000, and purchased the plant of the Kincaid Brick Company, which has a daily capacity of 50,000 brick and hollow ware. B. F. Kincaid, of Ewing, Va., is president, W. B. Kincaid vice-president and manager, and V. G. Schimmel secretary of the company.

The Molalla Fire Clay Company, of Malalla, Ore., has been incorporated with a capital stock of $100,000. The company has clay deposits extending over eighty acres. The officers of the company are president, P. M. Boyles; vice-president, Guy Dibble; secretary-treasurer, Ina Dibble. H. H. Daily, an experienced clayworker, will be manager.

Edward Barr, of Austin, Minn., one of the pioneers in the brick and tile business of northern Iowa and southern Minnesota, died quite suddenly at the home of his daughter in Rockwell, Minn., January 19. For many years Mr. Barr was associated with the Mason City Brick and Tile Company, but later moved to Austin, Minn., and engaged in the brick business. Mr. Barr had many acquaintances among the clayworkers of the country. His wife and four daughters survive.

The capacity of the plant of the Malvern Fire Clay Company, located a mile east of Malvern, O., will be doubled with the completion of a $100,000 improvement recently started, which will increase the size of the plant from twelve to twenty-two kilns. The work was started during the recent break in weather and is expected to be completed by May 1. The company is supervising the construction work and products of the plant are being used in the enlargement. H. C. Downer is general manager of the plant; H. C. Ross, secretary and treasurer, and W. R. Elson, president and assistant superintendent.

The machinery house and power plant of the Acme Press Brick Company near Denton, Texas, were destroyed Monday morning, January 15, by fire starting at about 12:40 o'clock. The building with its equipment is a total loss, estimated $10,000 and $12,000, with no insurance. The fire started from waste in the hands of the assistant night burner, whose duty it was to wipe off he machinery of the plant during the night for the run next day. He was wiping off the engine when the waste caught from an open torch. The piece of waste was soaked with oil and was aflame all over when he dropped it. The burning waste fell into the pit of the drivewheel and ignited waste oil there. From there the flames spread rapidly until within a few minutes the entire inside of the building was afire. The plant was located outside the city limits and the water supply had been cut off over Sunday, so the plant was without fire protection when the fire started. The company will at once start the work of rebuilding, so as to be ready for spring trade.

Bond & Avery have purchased a site of land at King City, Cal., on which they will erect a plant for the manufacture of red building brick.

The Kankakee Tile and Brick Company, Kankakee, Ill., recently received an order from the United States government for twenty cars of fireproof building tile to be shipped to Panama. The tile purchased by the government is subject to rigid inspection.

John Busse, one of the pioneer brick manufacturers of Chicago, Ill., died at his home in that city January 22, at the advanced age of 81 years. He had lived in Chicago since 1855, and had been engaged in the brick business from 1866 to 1900. His widow and six children survive.

John Chard, an architectural designer and builder, of Santa Barbara, Cal., has undertaken the task of bringing about the extensive use of adobe brick in that section, by building a house for his own use of adobe brick. He has evolved a constructive process and appliances, for which patents are now pending.

The Athens Brick and Tile Company, of Athens, Tex., of which C. H. Coleman is president, has acquired the plant of the Athens Pressed Brick Company, and will install fire brick, hollow building tile, drain tile and face brick machinery. Forty thousand dollars will be expended on the plant.

Advances of $1 to $3 a thousand on all building brick have been announced by Omaha, Neb., manufacturers and retailers. Common red brick which sold until recently at $7.75 a thousand, is now $8.75, and face brick prices advanced correspondingly. Increased wages and fuel amounting to from 25 to 35 per cent are the causes.

The Fromberg, (Mont.) Brick Company the latter part of January, declared a dividend of 50 per cent and passed out to its employees a bonus of $1,300 as the result of its successful operation. Capacity business has prevailed in the plant of this company throughout most of the year and at times there has been difficulty in delivering orders, owing to the unprecedented demand for building material.

Resigning their positions with the Far West Clay Company, Albert Armstrong, secretary-treasurer, and H. R. Kreitzer, sales manager, have opened offices at 401-2 White Building, Seattle, where they will be northwestern representatives for the Interstate Clay Products Company. Mr. Armstrong was one of the organizers of the Far West Clay in 1908, and Mr. Kreitzer had been sales-manager for five years.

The firm of Jansen & Zoellers, Peoria, Ill., has been dissolved, after many years of successful brick and paving contracting business. Charles Zoeller will engage in the brick contracting business for himself, while D. H. Jansen will continue the paving business of the old firm. Mr. Zoeller and John Jansen started the business in 1862, and Mr. D. H. Jansen has been a member of the firm for about twenty-five years.

Through the transfer of forty-three acres by the Alex A. Scott Brick Company, Knoxville, Tenn., to the Kingston Pike Brick Company for the consideration of $84,999.97, all of the real estate, property and operations of the Alex A. Scott Brick Company, as well as the good will of the company and all property operated by the Scott Brick Process Company was taken over by the purchasers. It is understood that the Kingston Pike Brick Company is backed by eastern capitalists. The plant will continue operations in the manufacture of brick for the market, and to perfect the dry brick process. The transaction is considered of great importance to the industry, as the capacity of the plant will be increased. C. N. Mynderse, who has been secretary-treasurer of the two companies involved in the deal, will remain secretary-treasurer of the new concern.

Sparta, Wisconsin. Brick pavement filled with Barrett's Paving Pitch.

Barrett's PAVING PITCH

A brick pavement, but not noisy

THIS main business street of Sparta, Wis., is paved with brick. You might expect that, when traffic comes in from the farms, filling the streets with vehicles, the pavement would be exceedingly noisy, but such is not the case because the joints of the brick are filled with Barrett's Paving Pitch.

Pitch is an ideal non-conductor of sound. It is incapable of vibration. The blow of a horse's hoof does not resound along the brick surface for yards as it does in a monolithic cement-filled brick pavement. Likewise there is no hollow rumbling at various spots. Such rumbling in a cement-filled pavement is caused either by a slight bulging of the brick in hot weather or by some settling of the foundation which the bricks fail to follow, leaving a hollow space. When such air spaces develop under the pavement, the brick acts like a drum-head, greatly magnifying the sound. There are no such noisy spots in the main street of Sparta.

The pavement has now been down seven years. Mr. C. H. Millard, Superintendent of Streets, recently reported it to be in perfect condition.

There is not a crack in its entire length and there never will be one, for cracks are impossible in a pitch-filled pavement.

Neither have there been any expansion troubles; no thrusting out of line of manholes or curbs; no bulges nor blowouts due to the expansion of brick in hot weather, for such things are impossible where *every joint is an expansion joint.* Hundreds of cities have solved their brick-paving problems with Barrett's Paving Pitch. Would you like to see the evidence? A booklet will be mailed *free on request.* Address our nearest office.

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TRADE B MARK

MONOLITHIC BRICK PAVEMENTS

(Continued from page 153.)

bed and the brick surface. The poorest results were shown when the 4-inch brick surface was used, composed of repressed block. The glazed surface upon the repressed block has a tendency to prohibit perfect bonding between the brick and the mortar. However, the tests are not a disappointment because they show relatively high strength or modulus of rupture. In every case the greatest strength in comparison with the thickness of the slab was in the 1:2:4 concrete base.

The 1:3:5 base, as shown in tests Nos. 9 and 11, does not show so great strength per square inch as where a 1:3:6 base was used, as shown in tests Nos. 5 and 8.

Comparison with Sand Cushion.

An interesting feature of these tests is brought out by the comparison of the standard type of construction, with the sand cushion, and any of the other monolithic types. By a comparison of test No. 5, which carries a load of 13,950 pounds per yard on a 66-inch span, with test No. 4, composed of 1:3:6 base, 6 inches thick, with 3½ inches of brick superimposed upon sand cushion, which only carries a load of 4,951 pounds, or only 35 per cent of the strength of the monolithic construction.

Brick Surface Carries Load.

It is probably unfair to make a comparison in this case, but it serves well as a demonstration of the superiority of monolithic construction. It can be seen that when the brick course fails there is nearly 1,000 pounds greater load sustained on the brick than the ultimate strength of the concrete base beneath it; as a consequence, the base fails as a separate unit. This can be demonstrated by assuming the modulus of grouted brick 4 inches thick at 950 pounds, as shown in test No. 3; the calculated load for brick slab alone then would be 5,097 pounds, which is only 112 pounds less than the total load for a 36-inch slab on 66-inch span with the concrete base. This would indicate that so far as proportioning strength is concerned, the base is a negligible item. Of course, in practice we know this is not true, but it serves the purpose for which it is intended. However, unequal conditions of sub-base or of soil beneath the base would create just such conditions as shown in these tests. Where, by chance, a load should be sustained on this type of construction greater than the strength of grouted brick, it will cause the failure of the base beneath it. I think this is demonstrated in practice quite often, although it is not generally detected by engineers inspecting the failures of brick construction.

1:3:6 Base, 6 inches Thick, with 2¾-inch Brick. This Shows the Bonding Value of Wet Mortar Bed.

Relative Strength.

In giving the relative strength of these various slabs it is not intended that test No. 5, adopted as 100 per cent, is an ideal pavement under all conditions. It is only logical that the greater the thickness of brick on the same base, the greater the strength, and that the life of such type would be longer in such pavement. Again, to secure the relatively strongest pavement for the least cost is the most desirable end to accomplish, when competition of other types of pavement is as keen as at the present date.

The discussion, in general, of what I may term old-style construction is in place to bring out the relative merits of monolithic, cement and sand cushion brick pavements, together with plain sand cushion. There have been a great many arguments for and against the cement and sand cushion, and for and against the sand and loam cushion; no doubt there are arguments in favor of both types.

Washing Out of Sand Cushion.

In an editorial of the Engineering News of August 5, 1915, in a discussion of mortar beds for brick and stone pavement, the writer makes the following statement: "It has been claimed that the use of mortar bed in place of sand cushion prevents the failure of the pavement by the washing out of the sand, but what paving engineer ever heard of a properly constructed granite block pavement that failed in this manner. On the other hand, it may be claimed that a very lean dry mixture of cement and sand does not set up into a hard, rigid mortar, but has stability while still retaining a certain amount of elasticity and resiliency, but the thin sand cushion has these qualities also, so why use cement at all?"

Rigid Surface on Elastic Foundation.

It has always seemed to the writer a foolish construction to try to obtain a superimposed rigid layer of brick upon an elastic foundation, which no doubt a sand cushion gives. The engineers throughout the country hold rigidly to the sand cushion to add resiliency as a desired feature of brick pavement, but since the use of cement grouted brick gives a rigid surface, it is nothing more or less than, by comparison, using a layer of glass laid upon an elastic foundation such as sand and subjecting it to any impact. It is only natural that the glass cannot sustain any great load under these conditions. However, if that same sheet of glass had perfect contact upon a rigid foundation at every point, it would only break by a load in excess of its compressive strength, or an impact.

Surface Elastic as Well as Cushion.

The same conclusion applies to grouted brick pavement, the result being that, due to contraction cracks, it is a very easy matter to break down the bond of the bricks one by one where the only foundation is a resilient substance such as sand. If resiliency in a surface is desired (and I am not convinced that it is), then I think that the surface should be elastic as well as the cushion it rests upon.

Use of Bituminous Materials.

There have been many drawbacks when material such as pitch, tar or asphalt have been used in various manners to give an elastic surface, owing to the heat in summer causing any bituminous product to run, and the hardening in the winter causing it to crack and break away from the bricks, leaving the edges of the brick unprotected.

I think where the temperature changes are not great, as in the Northwest, an asphalt product could be obtained that would not become soft in summer or brittle in winter to a point where it would be injured by either cracking or running out of the joints. The pitch or asphalt filled pavement has one advantage, that of prohibiting water reaching the sand cushion or foundation, which is not true of a cement grouted pavement.

Prohibits Water Reaching Sand Cushion.

Answering the argument previously mentioned, "What paving engineer ever heard of a properly constructed granite block pavement fail by water reaching the sand cushion?" if

(Continued on page 188.)

Why

are you satisfied to be unprogressive and to continue to burn up wastefully money that should be turned into your coffers and paid out in the shape of dividends?

don't you get busy to-day and investigate the immense savings possible only with the

UNDERWOOD PRODUCER GAS BURNING SYSTEM?

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The application of this system to your periodic kilns, either up or down draft, can be done at a very moderate cost and with the absolute certainty that you will get substantial returns that will be a revelation to you.

We will be glad to take up this subject with you if you will just drop a line telling us you are interested.

A Producer Gas Fired Dryer

Is positively the last word in drying clay products. It is applicable to any direct heat type of dryer. When it is done "OUR WAY," that is, according to our plans and with our moderate appliances, the results will astonish you. The investment is not great, in fact, is only nominal, but it is a powerful factor for giving you substantial returns. Drop us a line to-day asking how it can be done.

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MONOLITHIC BRICK PAVEMENTS

(Continued from page 186.)

this may apply to brick also, I could point out any number of cases of this nature in brick pavements. However, it is not necessarily the failure of the brick pavement, even though the bond may be broken between the bricks and water allowed to reach the sand cushion, as the pavement may remain in serviceable condition for many years thereafter.

Cracks in Grout-Filled Surface.

Cracks are bound to occur in a grout-filled pavement, no matter how carefully laid, due to expansion and contraction and to the breaking down of the arch effect that may be caused by expansion. Once these cracks appear, if not taken care of, the bond of the brick on either side begins to fail. As an indication of this, an investigation after a heavy rain, when the surface has been dry for several days, will show that wherever the drying of the surface takes place first will be found water seeping into the sand cushion below. After a period of time, when the bond at these various places is well broken down, it is only natural that the sand should be partially washed out from under these bricks. The porous condition of the sand will always allow water to work its way under the well-bonded portion. Should freezing weather occur at this stage, the result would be the upheaval of the brick surface to a greater or less extent.

Depth of Grout.

In practice it has been difficult to obtain a well-grouted pavement to the full depth of the bricks. In order to compress the sand cushion and to bring the brick to an even surface, it has been the practice to roll the brick with a three to five-ton roller. This process forces the sand from ½ inch to 1½ inches up into the interstices between the bricks. When the grout is applied the pavement is not grouted the full 4 inches, but only to the depth of 2½ or 3 inches. This has been in some instances partly corrected by the use of loam and sand previously rolled before the laying of the brick, but again rolling the brick after laying. Probably in some instances this will prove a success, but in others the use of loam and sand has been of such quality as to detract from rather than add to the value of the cushion. The loam added is invariably material most easily obtained, which may be a very light, flour-like soil, and which cannot be compressed to any material advantage. This lighter soil only has a tendency to work its way up into the interstices of the brick and prohibit the grout reaching the full depth of the brick. Again, if water strikes this type of cushion, it would deteriorate much faster than coarser sand, and create an unevenness of the brick surface.

Strength of Brick Surface Demonstrated.

The strength of a grouted brick surface as compared with the strength of a concrete base beneath was well demonstrated at Worcester, Ohio, where a washout of the sub-base created a failure of the concrete slab, but left the brick resting on either end of the foundation. The strength of this brick was sufficient to hold up a touring car. This work is a very good example of what a grouted brick surface should be, but in practice is rarely obtained.

Use of Cement and Sand Cushion.

Recent use of cement and sand cushion has been quite an added improvement in brick construction, but has also increased the cost. The use of the cement and sand cushion has eliminated any resiliency that may have existed in the sand cushion, and has given to the brick surface a stable and solid foundation, unless by the creeping of the surface by expansion and contraction the brick move from the original recesses in this mortar bed created at the time of laying, which would have a tendency to make each individual brick rest upon an uneven bed, which is not ideal by any means, but is in all probability superior to a sand cushion unevenly compacted or uneven in its surface. This creeping of surface, even where transverse expansion joints are eliminated, will occur to a slight extent.

Elimination of Noise.

Another quality of the cement-sand cushion or mortar layer is the elimination of the rumbling noise so often heard in sand cushion pavements, providing that an arching of the surface has not taken place, separating the brick from the base beneath.

The argument that brick will stand more compression with a resilient cushion beneath than when resting upon a rigid foundation is doubtful in the writer's mind. In any event, the compressive strength of brick is very much in excess of any traffic conditions the pavement may be subjected to, and surely if the brick has not this quality then it would not be desirable surfacing under any condition.

Tests of Compressive Strength.

Tests of compressive strength of brick conducted by Mr. Newhall give an average of 10,700 pounds under dry condi-

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Stand today as they have for the past twenty-five years as the leaders of their class.

No others are so accurate or so thoroughly interchangeable.

None are so easy to use or so practical for severe high temperature measurement. No others give the length of service that these give.

Their slightly higher first cost is due wholly to actual material involved. For example, the Platinum and Platinum Rhodium Thermo Elements are a third heavier, length for length, than most others.

The advisability of putting this extra small amount into the first cost is proven by the fact that the maintenance cost on Heraeus Pyrometers rarely exceeds five per cent.

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tions and 8,230 when wet; it is not logical that brick pavement would be subjected to within 25 per cent of this weight.

Mr. Newhall made tests, at the same time, of the strength and deflections of grouted brick beams, which are given here below:

Beam Tests.

Beam No.	Dimensions of Beams Height	Width	Span	Defl. at Max Load Inches	Max Load Lbs.	Modulus of Rupture lbs.sq.in.	Cement Sand Mixture	No. of Brick Ruptured
1	4 in.	12 in.	42 in.	0.037	3290	1080	1:1	1
2	4 in.	12 in.	42 in.	0.038	3000	984	1:1	1
3	4 in.	12 in.	42 in.	0.043	3015	989	1:1	1
Average				0.039	3101.6	1018		
4	4 in.	12 in.	42 in.	0.026	2800	918	1:1½	None
5	4 in.	12 in.	42 in.	0.020	2615	857	1:1½	2
Average				0.023	2707	887		
6	4 in.	12 in.	42 in.	0.030	2410	790	1:2	None
7	4 in.	12 in.	42 in.	0.034	2350	771	1:2	None
Average				0.032	2380	780		

All tests 30 days old.

Tests Nos. 1, 2, 3, 1:1 grout used in two applications.

Tests Nos. 4 and 5, 1:1½ grout used in two applications.

Tests Nos. 6 and 7, 1:2 grout used in one application.

Modulus of Rupture of Paving Brick.

Mark	Dimensisns Height	Width	Length	Span	Maximum Load	Modulus Rupture
1	3.94 in.	2.33 in.	8.49 in.	6 in.	9975	2460
2	4.04 in.	2.29 in.	8.37 in.	6 in.	12350	2970
3	3.89 in.	2.40 in.	8.51 in.	7 in.	7920	2290
4	4.03 in.	2.37 in.	8.42 in.	7 in.	8550	2330

Average modulus of rupture, 2,512 lbs. per square inch.

Compression Test on Paving Brick.

Mark	Moisture Condition	Cross Sec. Under Test	Began to Sweat lbs.	Load at First Crack lbs.	Max Load lbs.	Max. Ld lbs. per sq. in.
3	Dry	3.89x4.48 in.	......	96,000	164,800	9,460
4	Dry	4.03x4.31 in.	......	72,000	209,000*	12,030*
3	Wet	3.89x4.02 in.	52,000	66,000	121,400	7,700
4	Wet	4.03x4.06 in.	42,000	84,000	142,000	8,690

(*) Exceeded the limits of the machine.

Tests made on one-half brick, laid flat.

Average compressive strength, dry, 10,745 lbs. per sq. in.

Average compressive strength, wet, 8,230 lbs. per sq. in.

Many tests have been made to determine the modulus of rupture of concrete beams.

Taylor and Thompson (Concrete, Plain and Reinforced, page 376, 1909 Edition) give the following values for the modulus of rupture of plain concrete beams 30 days old:

For 1:2:4 mixture the modulus of rupture is 439 lbs. per sq. in.

For 1:3:6 mixture the modulus of rupture is 226 lbs. per sq. in.

Baker (Masonry Construction, page 112, 1902 Edition) gives for beams 56 days old:

For 1:2½:5 mixture a value of 165 lbs. per sq. in.

For 1:2½:6 mixture a value of 130 lbs. per sq. in.

The difference in the values given by these authorities is explained by the fact that Professor Baker's results were the average of values obtained from testing a great number of beams made of different materials, both selected and commercial, while the Taylor and Thompson data were secured from a few tests made on beams constructed of carefully selected and graded silica sand and crushed trap rock. Concrete slabs made and tested later by the author had an average modulus of rupture of 289.7 pounds per square inch.

Inasmuch as Taylor and Thompson's values were secured from selected materials and Professor Baker's values were obtained from commercial mixtures, it appears fair to compare the values obtained by the latter with the values obtained for the brick beams.

It was found that the change in strength of cement mix-

(Continued on page 190.)

GANDY and Steam

"We have been using your belt for the past three years in our laundry as well as in our branch factories, and find it an excellent drive for any place wet or dry, and can highly recommend the same to all laundrymen and others."

STEAM gives leather belting gruelling punishment —makes it so hard and stiff that it can't grip a pulley. That means loss of power as well as loss of belting. All that means loss of money. Often, steam separates the laps of leather belting and the plant shuts down until new belting is installed.

GANDY stitched cotton belting stands the gaff of steam, heat, water, gas, oil and dirt. It is proof against all these destructive forces. GANDY belting will give you the best of service, the longest of wear under the most trying conditions.

Take advantage of our service department directed by skilled engineers. They will be glad to advise you in an entirely unbiased manner if you can use GANDY with profit. An inquiry will not obligate you, of course.

The Gandy Belting Co.
749 W. Pratt St., Baltimore, Md.
New York Branch, 36 Warren St.

A Practical Test

The LARGEST MANUFACTURER of one class of clay products in the world recently tested the

Hook Down Draft System

He built two new kilns, both connected to the same stack—one a 36' Hook Down Draft Kiln, the other a 30' kiln of his old type (as good as any common kiln). He regularly burns hard ware clear to the bottom of the 36' Hook Down Draft Kiln in **18 hours less time** than the 30' common kiln, with a **50% reduction** of the amount of ware spoiled in kilns, and with considerably less fuel. The 36' kiln has the better draft of the two. He (name upon request) pronounces the HOOK SYSTEM a thorough success.

We have many other such references.

Give us the number of kilns you have, kind of fuel, kind of ware, your present burning time and fuel consumption, and we will estimate the **SAVING** which the HOOK SYSTEM can make upon **YOUR** yard.

The Hook System is easily and cheaply installed in old kilns — less to build new than any other kiln of equal stability.

HOOK PATENT KILN CO.

High and Spring Streets
COLUMBUS, OHIO

NEW KILNS BUILT COMPLETE "READY FOR WARE" BANDS, GRATE BARS AND ALL ACCESSORIES.

MONOLITHIC BRICK PAVEMENTS

(Continued from page 189.)

tures is very slow after the 30-day period. Thus the results of 30, 40 and 56-day tests are comparable.

Taking the average modulus of rupture of a 1:2½:5 concrete as 165:

A brick beam grouted with 1:1 mixture has a modulus of rupture 6.17 times the modulus of a 1:2½:5 concrete beam.

A brick beam grouted with 1:1½ mixture has a modulus of 5.37 times the modulus of a 1:2½:5 concrete beam.

A brick beam grouted with a 1:2 mixture has a modulus of 4.72 times the modulus of a 1:2½:5 concrete beam.

In connection with the above data it is interesting to note some data on concrete slabs contained in recently issued pamphlets, showing the advantage of a concrete base because of its "bridging" strength. A cut shows a concrete slab of dimensions as follows: 5 inches thick, 11¾ inches wide and 36 inches long, made up of a 1:3:5 mixture, resting on supports 30 inches apart, and loaded on a 2¼-inch cleat with 1,650 pounds, the cleat being midway between supports. This load was sufficient to break the beam. The inscription on the cut calls attention to the "enormous bridging strength," and probably rightly so when compared with bituminous or asphaltic concrete mixture. Using the formula

$$M = \frac{3\,W\,e}{2\,b\,d^2} \text{ where}$$

W = Weight applied
E = Distance between supports
b = Width
d = Depth

for the modulus of rupture, as was used in the tests on the brick slabs, it appears this slab has a modulus of rupture of 247 pounds per square inch.

Strength in Practice.

Unfortunately, the strength of grouted brick surface is very seldom obtained in practice as great as shown by the tests conducted by Mr. Newhall. It is also interesting to note the deflection at maximum load is very small, showing rigidity of grouted brick beam.

(To be continued.)

Narrow Escape.

Mother (looking through magazine)—Darling, I see from statistics given here that every third baby born in the world is a Chinese.

Father (fondling his first-born)—Then thank goodness this is our first.—New York Globe.

Seattle is Honored.

The other day a colored brother, Washington by name, was presented by his wife with a fine set of brunette triplets. Confronted by the awful dearth of famous Washingtons after whom to name the youngsters, the perplexed father finally solved the problem as follows: The first child he named George, of course; the second Booker, equally as a matter of course; and the third he named Seattle.

Felt Her Loneliness.

"I suppose you miss your husband terribly?"

"Indeed I do. You can't imagine how lonely I am with no one in the house to contradict."—Detroit Free Press.

Their Disposition.

Women throw old shoes at a bride with the hope of hitting the bridegroom.—Toledo Blade.

TRADE NOTES

The Mack Brick Company, Ltd., of Montreal, Canada, has been incorporated with $500,000 capital stock.

The Claycraft Builders' Supply Company, of Columbus, O., has been incorporated to take over the sales department of the Claycraft Brick Company, and will act as sole agent for Claycraft brick in the larger portion of Ohio. W. T. Mathews is secretary of the new concern.

C. C. Allsman is in the market for a four-mold dry press brick machine and other equipment.

The brick and tile plant of J. D. Ramsey, at Stryker, O., which has been idle for several years, is being overhauled and put in shape for operation.

The McNamee Clay Company, of Bath, S. C., has been incorporated with $200,000 capital stock. Carl C. Law, of Pittsburg, and Roy E. Harper, of Cleveland, are interested.

The address of Mr. J. A. Lansberry, who was formerly superintendent of the plant of the Southern Clay Manufacturing Company at Robbins, Tenn., is wanted. Can any one supply it?

Practical brick men who are looking for a good location for the establishment of a clayworking plant will do well to correspond with Ewen MacIntyre, Enterprise Building, Albany, N. Y., who has some fine inducements to offer.

Plant No. 2 of the American Brick and Tile Company, at Mason City, Ia., was completely destroyed by fire January 31, which originated in the dryer. The loss is estimated at $50,000, which is partly covered by insurance. The plant will be rebuilt at once.

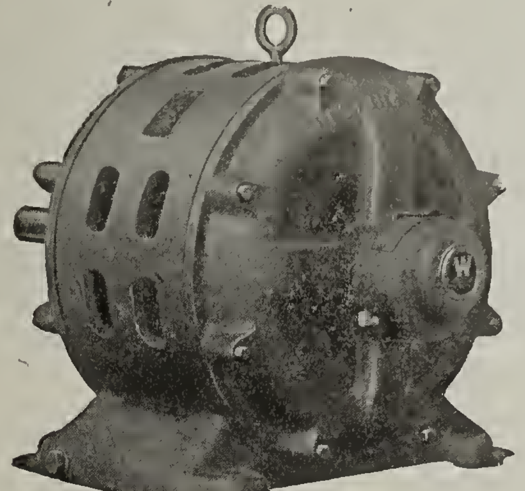
J. L. Buckley, for the last two or three years manager of the Davenport, Ia., branch of the Hydraulic Press Brick Company, will retire March 1, and C. W. Irwin, who has been connected with the Minneapolis office of the Hydraulic Press Brick Company, will succeed Mr. Buckley.

Sheffield, Ia., is to have a large brick and tile plant, which will be erected by a $250,000 company which is being organized by C. L. Smith and C. J. LeValley. Mr. Smith is one of the best known clay men in Iowa, having been for many years connected with the American Brick and Tile Company, of Mason City, and later with the Sheffield Brick and Tile Company, from which he retired eighteen months ago.

John Walter, one of the pioneer tile manufacturers of Chatsworth, Ill., and the father of George J. Walter, of that city, died January 20, at the advanced age of ninety-three years. He had lived in Chatsworth for more than fifty years, and had been connected with nearly all of the varied interests of the town. He was a remarkable man, in that he retained his mental faculties almost to the end.

The Capital Clay Company, of Des Moines, Ia., is a new concern which has been recently incorporated with $300,000 capital stock, of which $225,000 is paid up, to take over the large paving brick plant at South Des Moines, which has been operated for a number of years by the Barber Asphalt Paving Company. The manufacture of paving brick will be discontinued and the output of the plant will be about equally divided between building brick and hollow building tile or fireproofing. The officers of the company are: President, James W. Bollinger; vice president and secretary-treasurer and general manager, J. L. Buckley, all of Davenport. The plant is the largest in the State of Iowa.

A thirty-acre tract of land has been purchased at Bedford, O., by A. R. Markle, formerly superintendent of the Akron factory of the Robinson Clay Products Company, on which he, A. B. Eaken and Arthur M. Walker will erect a plant for the manufacture of clay marbles and bottles. Construction work on the plant will begin in the very near future.



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One Contract—
One Responsibility

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Westinghouse Electrical Equipment

We are in position to supply equipment from the steam supply to the productive machine, this includes:—

Stokers, Turbines, Generators.
Switchboards, Protective Apparatus.
Motors, Lighting Equipment, etc.

Without obligation on your part our engineers will be glad to solve your power problems.

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East Pittsburgh, Pa.
Sales Offices in All Large American Cities

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Drying and Burning
BOSS TEN-HOUR DRYER
Use either waste heat or exhaust steam.
No live steam. No direct firing.
BOSS SYSTEM OF BURNING BRICK
Applies to all types of kilns and will save HALF in your cost of burning.
Let us save Time and Money for you
JOHN C. BOSS CO.
Monger Bldg., Elkhart, Indiana

1917 Announcement
We can save you 25% of your fuel bill. No money until we do it. Don't you think this worth a stamp?
Then write to the
X. L. KILN & DRYER CO.
Box 269, Ottawa, Ill.

YOU HAVE KNOWN FOR YEARS THAT
RICKETSON'S MORTAR COLORS
are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.
Why Not Insist on Having Them?
They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.
Red, Brown, Buff, Purple and Black.
RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

NO. 1
KNOWN THE WORLD OVER
SCHURS OIL BURNER CO.
Los Angeles, Cal.
NOTICE!
TO
BRICK MFRS.
FOR
QUICK BURNS
AND
BETTER COLOR
BURN OIL
AND USE
SCHURS BURNERS

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

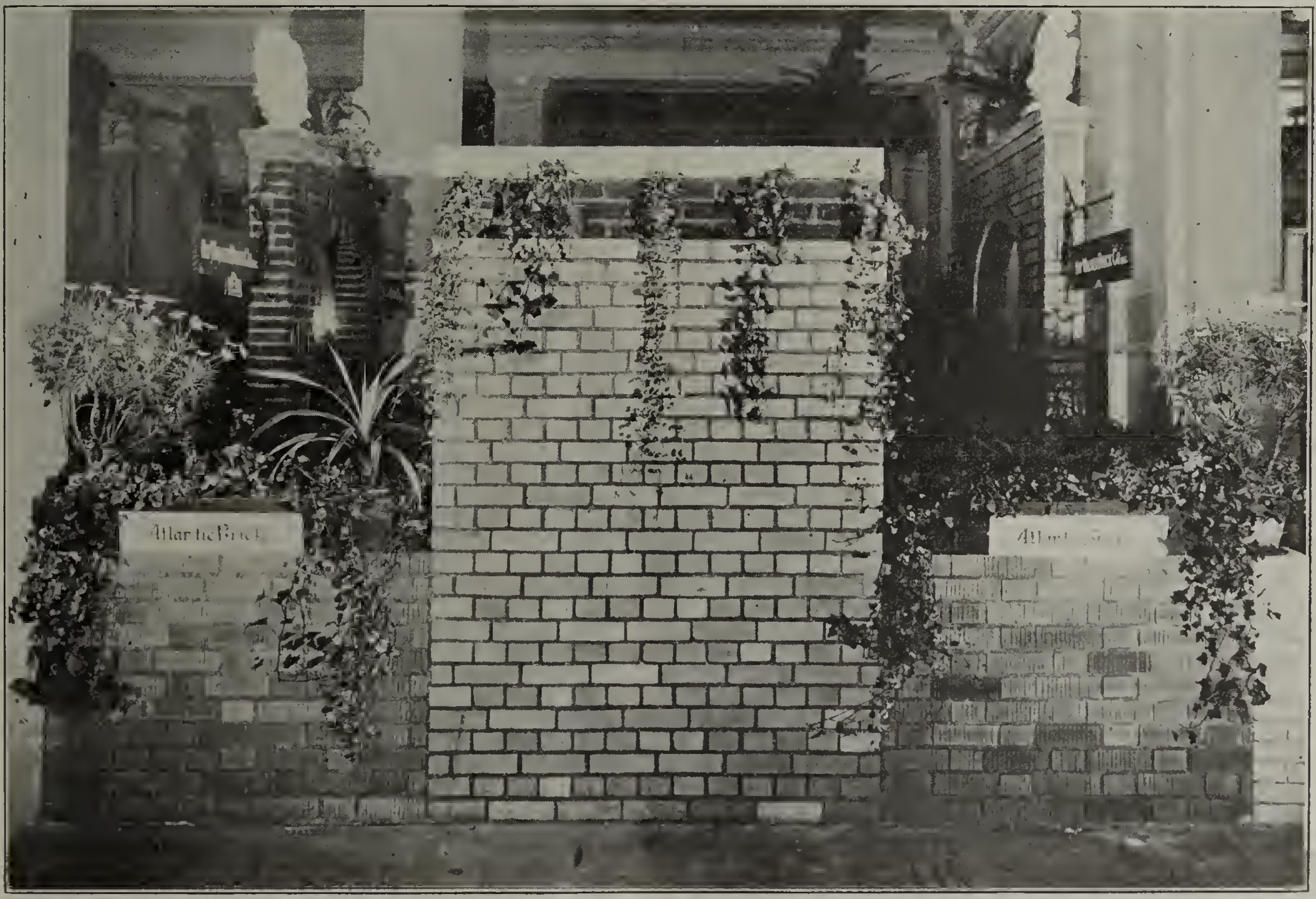
Vol. LXVII. INDIANAPOLIS, FEBRUARY, 1917. No. 2

THE COMPLETE BUILDING SHOW

One Attractive Exhibit of Face Brick Comprised the Representation of the Brick Industry.

BUILDING SHOWS undoubtedly have their uses, even though brick and clay men apparently do not think so, if we may judge from the lact of interest shown by them as exhibitors in the Complete Home Show at the Grand Central Palace, New York City, the week of March 5 to 11. The exhibits installed by brick and clay men made a very poor showing compared with the splendid exhibits made by the lumber men, the stone men and those connected with other lines of the building industry. The writer was amused by a bit of conversation heard at one of the booths in passing through the exposition. "This is a fine show," said one party. 'Yes," said the other, "but I am disappointed at the small part taken by the brick manufacturers." "Well," said the other, "perhaps they are too busy to bother with a show of this sort, and are afraid that an attractive exhibit might bring them more business than they can handle." "Well," said the other, "the lumbermen don't seem to be afraid," and the party passed on.

Only one brick firm had an exhibit—the Hay-Walker Brick Company, of New York City. The Mosaic Tile Company, of New Jersey, had an exhibit of its tile work, and a sanitary bath room furnishing firm had a small but neat display. The Clay-Worker had an attractive booth, showing in an effective way the superior advantages of brick over other building materials, and these four exhibits alone upheld the dignity of the clayworking industry as it was represented at the show. It is perhaps needless to compare what was done this year with what has been done previously, but the writer well remembers that when the building show was held at the Palace some years ago, the exhibit of brick, hollow tile and fire proofing materials were numerous and comprehensive, and evidently impressed those who visited the show for the purpose of securing information in regard to the building of homes, for they demonstrated the beauty of brick



Art in Brick Architecture, An Ocular Demonstration at the Complete Building Show, That Made Competitors of the Hay-Walker Company Envious in architecture in an effective manner. This year the timber men had it all to themselves.

The lack of interest on the part of the brick and clay men at this time is especially deplorable, for never before was the prospect better than it is now for the erection of permanent homes, in the territory surrounding New York City. The increase in rents, the inconvenience in getting back and forth within the city proper, the various other influences all tend to force the people out into the country. Undoubtedly there will be an era of home building. The crowds attending the show were large, fully up to expectations, and it is unfortunate that burned clay products were not more in evidence. Fortunately, the one exhibit was admirable in design and appearance. The pity is that there were not a dozen or more similar exhibits.

As will be seen by the accompanying illustrations, the exhibit of the Hay-Walker company, while not pretentious, was very pleasing in appearance. The famous Harvard front brick was used quite extensively, as was also their modern rough texture brick christened the "Atlantic." The decorative features were neat and tasty. The impression on the visitor was wholesome. Andrew A. Ayres and Robert L. Findlay, well-known brick salesmen of the firm, were on hand throughout the week to greet visitors and answer inquiries as to grades of brick, etc. Perhaps it will do no harm to tell an interesting little story connected with this exhibit, which was installed under the direction of Wm. C. Black, the New York representative of the Hay-Walker Company, whose main office is in Pittsburgh.

A competitor who visited the show looked over the display critically and said, "You have put one over on us, Black." "Do you really think so?" blandy replied Mr. Black, with a pleasant smile with which his acquaintances are very familiar. "Yes," was the retort, "and to tell the truth, I am glad of it, for the exhibit will help us all." When one's competitors are glad there is cause for rejoicing and congratulations, and we congratulate the Hay-Walker Company on their accomplishment.

Mr. Black did not decide to have an exhibition at the show until the last minute; otherwise the display might have been more elaborate. After the show opened and other face brick men realized that the Hay-Walker exhibit would make a hit with all visitors, they seemed prone to complain of the advantage the exhibit would give to the enterprising firm. On reflection, they themselves must concede that Mr. Black's enterprise entitles his firm to preferment.

The Mosaic Tile Company displayed some very attractive tiling, the chief feature was a large picture intended for the side of a bath room, worked out in colors, making a delicately tinted and very artistic decoration.

Naturally, there is a wide difference of opinion as to the importance of such expositions for advertising purposes. Judging from the discussions during the recent national convention, members of the N. B. M. A. appreciate the importance of publicity, but are not keen to take advantage of their opportunities such as were afforded by the Complete Home Show. Why, it is hard to divine. Perhaps the exposition was not exploited in a manner that appealed to them. Be that as it may, brick exhibits at the show were conspicuous by their absence.

While New York is a brick city, always has been and always will be, and it is well as occasion offers to impress this fact upon the people, lest they be led astray to their own loss and damage by the false gods of less worthy materials. Brick never disappoints, and brick manufacturers should never lose an opportunity to make this fact so plainly manifest that the veriest tyro in building materials cannot fail to understand and appreciate it.

There were many interesting exhibits, dealing with various building materials and appurtenances used about dwelling and commercial building. One real estate firm seized the opportunity to exploit a new suburban property to be offered home seekers the coming spring. If a series of attractive brick displays had been shown near this real estate feature, would not those who are going to build up this new addition been more apt to build with brick? Let us hope they will do so anyhow, because it will be to their advantage; but may we not properly admonish the brick manufacturers to be more alert and use to better advantage such opportunities for the exploitation of their products.

PLANT MANAGEMENT

By Richard B. Hoehne.

DOLLARS AND SENSE are valuable assets in nearly all stages of life; although some folks persist in doing without them; this policy would be impractical in managing a manufacturing plant, where both become inseparable tools. Has it not been proven by many a demonstration that neither of the two is worth much without the other, and that nothing but their harmonious combination can render the backbone required in management? A general knowledge of the specific branch of business will be of material benefit, yet it seems that the amount of knowledge required is dominated by the portion of money and common sense invested; in other words, it will take so much less of the former as there is surplus in the latter combined. I have arrived at this conclusion by what I have seen through many years of practice around clayworking plants, namely, that knowledge and experience could not "make it go" in some instances, while in others a confessed lack of practical knowledge did not even reduce the annual dividend, because of the activity of dollars and sense in the management.

Terra Cotta Panel in the Hay-Walker Exhibit.

Whereas money and knowledge will naturally appear to be logical implements in managing, it may not be equally feasible why common sense should be listed in the same category. For this reason I shall devote special attention to explain in what respect the use of common sense is of weighty importance to proper management.

Has it ever occurred to you that in ordinary life many transactions are perfected with common sense as the only means by which a party protects his interest? For example, imagine a lady buying an automobile. She is no mechanic and may not possess the slightest knowledge of machinery, but still may accomplish her purchase successfully by employing common sense in picking a reliable firm to buy from. Similar occurrences could be registered by the dozens every day in any branch of the clay industry. For instance, take the acquisition of a steam shovel, or locomotive; either representing a problem many a clayworks manager has solved with success, although he did not even know how to run them. This kind of a deal becomes more perplexing when the object is of the second-hand quality and not accompanied by a guaranty from the manufacturer, thus making it necessary to verify the actual value by estimation, which is not always a simple process; yet it has often been accomplished by the use of common sense. The contrary has also come to record by a brick company that had a "dinky" built to order. After the machine was ready for delivery, one of their employes was dispatched to inspect it. The "inspector" glanced at it and rejoiced over the brilliant paint shining at him, pronounced it O. K. That common sense had been lacking on the part of the management was experienced soon after the "dinky" had made her first run. The boiler proved to be an old, old piece of old iron; it was far from being tight at service pressure, and what would have happened to it at test pressure, which is 50 per cent. more—I feel a chill every time I try to imagine it. Judging from the ability and experience of the mechanic acting as inspector, it seems well justified to assume that the humbug would have been detected through the presence of the manager preventing the man to neglect his duty and keeping awake his ambition. Well, the dinky had been "bought and paid for" and the loss had to be accredited to lack of sense, thus proving my previous claim regarding dollars and sense.

General View of the Hay-Walker Display at Building Show.

In furthering this subject, I need but refer to the hiring of employes, in which transaction on the part of the employer hardly any faculty can be of better service than common-sense. This very circumstance may explain some of the mistakes that happen in engaging superintendents for the practical execution of plant management. By underestimating the responsibility incident to this occupation, the acquisition of men is not receiving due regard. In the first place, considerable consternation seems to prevail as to the meaning of this position. In some instances employers are seeking a superintendent, while it really is a day watchman or messenger that they want. In other cases companies advertise for a yard foreman, anticipating applications from men fit for a position as general superintendent. The worst case along these lines happened to me personally years ago when I was called to visit a brick company with a view of receiving employment as superintendent. All went well until I was made acquainted with a heap of wreckage. My query whether the superintendent would be confined to this being answered in the affirmative, I was also given to understand that I would have to furnish half the money necessary to make it a plant. Similar conditions exist to quite an extent, regardless of their nourishing effect towards distrust and uncertainty, which reflect themselves in misfortune to all concerned. Inasmuch as the word "superintendent" is easy to decipher by anybody, there is no obvious reason on either side to misinterpret its meaning.

Secondly, the tendency of practicing undue economy in salaries has proven illusive; on the other hand, common sense was in want to about the same extent by excessive patience with incompetent men. It is a quite common occurrence that applicants "young and cheap" triumph over experienced, expecting salary in accordance to their value, while the fact remains that a man chosen to master the entire operative forces confluent in the mechanism of a plant, can accomplish his purpose only if his preparative schooling is accordingly. Admitting that through misrepresentation, an applicant may have deceived the employer; but, should it not arouse suspicion if, for instance, after six months or one year of employment, the anticipated dividend is farther out of sight than at the time he started? Or if the plant is beginning to look more like a scrap pile than anything else? Or if the repairs on machinery run higher than formerly? Or if the kilns, which were surrendered into his charge in a sound condition, begin to fall apart? A judgment on this basis, however, would be justified only after the superintendent had been given a chance to use his skill and to exercise his authority; if he is not at all occupying a position in conformity to his title, or his work and disposition are frequently interferred with by some that claim to know better, then, of course, it becomes a difficult task to gather conclusive evidence for conviction.

(To be continued.)

DETROIT BRICK MANUFACTURERS DISCONTINUE PUBLICITY WORK.

Market conditions in Detroit and vicinity are such that brick manufacturers find it extremely difficult to meet the demands for building brick. In fact, large quantities of brick have been shipped in from other points during the past season. In view of these conditions, it has been determined to close the office of the association, which was devoted chiefly to publicity work. Mr. William Wreford, who has served the association so ably, will in the future devote himself to other lines of activity. It has been intimated that he will go into business for himself, handling a line of face brick, terra cotta, etc. Should he do so, his hustling qualities and wide acquaintance will make him a factor locally in that branch of the business.

HOLLOW TILE MANUFACTURERS MEET.

At a meeting of the Hollow Tile Manufacturers' Association, held in New York City, at Hotel McAlpin, March 8, there was a good representation from over a large part of the United States and Canada. Much enthusiasm was shown by all those present and it was evident from the interest taken that an organization to advance the uses of hollow tile and carry on an educational campaign was imperative to every manufacturer present.

At this meeting it was decided that local organizations should be kept together and which should be closely affiliated with the national organization. Monthly meetings of the national organization will be held, at which some one or more members of each local group will be present.

Three of these meetings each year will be held in eastern territory, three in Ohio territory, three in Illinois territory and three meetings to be arranged for during the year at points where the association may decide would do the most good, one of which will be the annual meeting and which will be held or arranged for at some central or most convenient place for all the members.

Officers for the year 1917 are as follows: President, H. C. Downer; vice presidents, H. M. Keasby, J. B. Whitacre, E. R. Sturdevant, B. C. Keeler and G. A. Gorman.

The next meeting of the Association will be held at Hotel Statler, Cleveland, Ohio, Wednesday, March 28.

THE N. B. M. A. CONVENTION

THE THIRTY-FIRST ANNUAL MEETING PROVES NEW YORK TO BE A GREAT CONVENTION CITY. LARGE REGISTRATION, WELL ATTENDED SESSIONS, GREAT GOOD FELLOWSHIP AND ENTHUSIASM CHARACTERIZE THE BIG MEETING

THE CONVENTION ON BROADWAY was a most gratifying success from every reasonable viewpoint. While the registration fell some short of that at Cleveland, the attendance at the sessions was larger and the interest manifested in the proceedings, more earnest and enthusiastic. In the latter respect it much resembled the meetings in the early years of the Association, when the members vied with one another for recognition, and discussed the questions under consideration with a vigor and heat that brooked little restraint.

It was, in fact, an old time love feast, strong in personal interest and good fellowship, that recalled the meetings of bygone times more than any of recent years.

The prophesy that there would be a record breaking attendance was not realized owing chiefly to the unhappy industrial conditions which prevailed in the Middle West. The car and coal shortage alone kept many of the faithful at home, who otherwise would have been present and would have made their presence felt. The numerical roster shows an enrollment of 408, with the ladies added it totals 540. Had the members of the American Ceramic Society registered, as they have in former years, the total would have gone beyond the seven hundred mark.

The one session a day proved a happy plan and will no doubt be observed at future conventions, wherever there is a demand on the time of the delegates outside of or in addition to the deliberative sessions. Hotel McAlpin proved in every way adequate and satisfactory, so much so that not a single complaint was registered at the official headquarters. There was no demand for bath tubs, except for bathing purposes.

The Entertainment Features.

As was anticipated neither the days nor the nights were long enough to enable the visitors to do everything they desired. They were all bent on having a good time and we heard no expressions of disappointment. On the other hand the lobby talks were almost without exception tinged with jollity. Shop talk was not tabooed, but it was less dominant than is usually the case. The formal entertainment features were well patronized and thoroughly enjoyed. This is especially true of the smokerette, which proved a tremendous hit and was a complete justification of the secretary's claim that a stag party is obsolete and undesirable. The local committee having the function in charge were complimented again and again on the delightful character of the entertainment. All present, old and young alike, strictly observed the ancient injunction, "Eat, drink and be merry." All formalities were thrown into the discard and the social features much resembled a happy family gathering. There was a surfeit of good things to eat and drink with an accompaniment of music of a popular sort, a series of entertaining vaudeville stunts, interspersed with dancing by all who cared to indulge, and it seems that "everybody is doing it" these days.

Pleasure Trips for the Ladies.

The committee in charge of the entertainment of visiting ladies was woefully handicapped by a spell of very bad weather; rain and snow alternated for the first two or three days of the week, making outdoor trips a task, not a pleasure, but the sky finally cleared and under the indefatigable leadership of Alfred Pettit, of the Chestnut Ridge White Brick Co., several very enjoyable side trips were made. The automobile ride over Riverside Drive, past Grant's Tomb, through Central Park and down Madison Avenue proved very pleasing. The following day, there were a number of personally conducted tours through Hotel McAlpin, starting with a view of the city from the roof top. Every department of the hotel was inspected, and it proved the trip of a lifetime. At its conclusion tea was served in the beautiful Gold Room and the visitors were treated to some exhibition dancing, after which those who desired participated in this popular amusement. On departing each visitor was given a large box of candy made in the hotel. Of course, there were shopping trips galore, and several individual parties saw Chinatown and other interesting sights after dark.

The Convention Sessions.

Contrary to expectations, the deliberative sessions were all well attended. The delegates were unusually prompt in responding to the secretary's megaphone announcements and were in their seats in the convention hall in good time, and gave their undivided attention to the proceedings. The intense interest manifested was gratifying to the officials and speakers, who were inspired by the large and attentive audiences. President Deckman lived up to his reputation for promptness by calling the first session to order at precisely 10:00 a. m., according to program. His successor, Fritz Salmen, not to be outdone in orderly procedure, was in the chair, gavel in hand, each morning as the hands of the clock pointed to ten. The delegates were started right in their work by Rev. James B. Wasson, of New York City, who asked for Divine guidance. The address of welcome, by Fire Commissioner Adamson, who represented Mayor Mitchell, was timely and clever and touched a responsive chord as was evidenced by the rousing applause at its conclusion. The response, by R. C. Burton, of Zanesville, Ohio, was both humorous and instructive and has made him a marked man for program work in the future.

President Deckman's Annual Address.

As was to be expected, President Deckman's annual address was a model of conciseness and well deserved the many compliments paid him by the old-time members. His reference to the credit due the N. B. M. A. as the parent organization, ought to sink deep in the minds of those who are directing the affairs of affiliated organizations, each of which is greatly indebted to the organization from which they have sprung. The address will be given in full, together with all papers and addresses, and discussions following same, in the official proceedings which will be published verbatim in a special issue of The Clay-Worker, which will be issued a couple of weeks hence.

Treasurer Sibley, of course, made his usual hit by providing some good stories and a substantial surplus for the year.

The Election of Officers.

As has become a rule of the Association, the president was succeeded by the first vice-president and the other officers promoted up the line. Mr. W. K. Hammond, one of the most popular brickmakers on the Hudson River was honored with the third vice-presidency, a very happy selection as was proven by his subsequent service, both as toastmaster at the banquet and on the floor of the convention. Mr. W. D. Richardson was elected to succeed himself on the Committee of Technical Investigation.

The technical papers were of a high order of excellence as will be seen when the proceedings are published. The banquet afforded a delightful evening's entertainment, and though some of the notable speakers who were on the list of toasters were unable to be present, there was no lack of talent. Treasurer Sibley and Rev. Dr. Wasson each proved pinch hitters par excellence. Herman Mueller, of Trenton, N. J., the first formal toaster, made a tremendous hit and Mr. Lounsbury, who, by choice, was placed last on the list, proved a master after-dinner speaker.

All in all, the convention was a decided success, proving that New York is a splendid convention city. Those present, without exception, will vote to play a return engagement there whenever circumstances will permit.

NUMERICAL ROSTER N. B. M. A., NEW YORK, 1917

NAME FIRM TOWN

1. J. W. SIBLEY, South Pav. Brick Mfrs. Assn., Birm'g'm, Ala.
2. C. P. MAYER, C. P. Mayer Brick Co., Bridgeville, Pa.
3. J. C. ROBINSON, Clay Products Corp., Hampton, Va.
4. C. A. GARDNER, Am. Enam. Brick & Tile Co., N. Y. City.
5. OTTO C. BACH, Bach Brick Co., Chicago, Ill.
6. J. A. DOLBEN, Boston, Mass.
7. JAMES E. RANDALL, The Clay-Worker, Indianapolis, Ind.
8. R. C. BURTON, Burton-Townsend Co., Zanesville, O.
9. J. W. ROBB, Clinton Paving Brick Co., Clinton, Ind.
10. A. J. DUNN, Chase Fdy. & Mfg. Co., Columbus, O.
11. THEO. A. RANDALL, Secretary N.B.M.A., Indianapolis, Ind.
12. W. S. WILLIAMSON, U. S. Rubber Co., Brooklyn, N. Y.
13. HENRY B. LOVELAND, Ellicott Brick Co., Jewettville, N. Y.
14. C. C. BLAIR, Metropolitan Paving Brick Co., Canton, O.
15. W. A. DAY, The Frost Mfg. Co., Galesburg, Ill.
16. M. W. BLAIR, Thornton Fire Brick Co., Thornton, W. Va.
17. D. B. POTTER, Thornton Fire Brick Co., Clarksburg, W. Va.
18. BURTON H. ALLBEE, The Clay-Worker, New York City.
19. W. T. BLACKBURN, Dunn Wire-Cut-Lug Brick Co., Paris, Ill.
20. R. T. STULL, Dunn Wire-Cut-Lug Brick Co., Conneaut, O.
21. W. C. PERKINS, Dunn Wire-Cut-Lug Brk. Co., Conneaut, O.
22. W. A. MEDDICK, Lakewood Engineering Co., Cleveland, O.
23. GEORGE B. MENTZ, G. B. Mentz Co., Wallkill, N. Y.
24. M. SILVERMAN, International Clay Mach. Co., Dayton, O.
25. R. H. McELROY, International Clay Mach. Co., Dayton, O.
26. G. A. ANDERSON, International Clay Mach. Co., Dayton, O.
27. H. L. IRWIN, International Clay Mach. Co., Dayton, O.
28. JOHN P. GOHEEN, Brown Instrument Co., Philadelphia, Pa.
29. GEORGE KELLER, Brown Instrument Co., Philadelphia, Pa.
30. J. W. ANDERSON, Brown Instrument Co., Philadelphia, Pa.
31. F. L. STOWELL, Sterling Brick Co., Olean, N. Y.
32. CHAS. J. DECKMAN, Medal Paving Brick Co., Cleveland, O.
33. F. Y. STEWART, U. S. Rubber Co., New Rochelle, N. Y.
34. W. H. KERSHAW, Aspha Bric Co., New York City.
35. R. P. BARRETT, Aspha Bric Co., New York City.
36. L. W. GAY, Aspha Bric Co., Buffalo, N. Y.
37. JOHN E. SCHUESLER, Buffalo, N. Y.
38. HENRY BENDER, Buffalo, N. Y.
39. JOHN DIETSCHLER, Buffalo, N. Y.
40. CHAS. B. REINHART, Queen City Brick Co., Buffalo, N. Y.
41. WM. J. GRAAP, Buffalo, N. Y.
42. B. E. PLACE, E. M. Freese & Co., Galion, O.
43. R. A. WHISTON, E. M. Freese & Co., New York, N. Y.
44. H. WIRSCHING, Standard Dry Kiln Co., Indianapolis, Ind.
45. C. B. THWING, Thwing Instrument Co., Philadephia, Pa.
46. H. K. WALTON, Thwing Instrument Co., New York City.
47. W. K. HAMMOND, New York, N. Y.
48. R. R. SOISSON, Jos. Siosson Fire Brick Co., Connellsville, Pa.
49. M. E. GREGORY, Brick, Tile & Terra Cotta Co., Corning, N. Y.
50. RAYMOND C. PENFIELD, Am. Clay Mach. Co., New York.
51. L. W. PENFIELD, Am. Clay Mach. Co., Willoughby, O.
52. R. O. PERROTT, Am. Clay Machinery Co., Bucyrus, O.
53. DAVIS BROWN, Am. Clay Machinery Co., Bucyrus, O.
54. HAROLD PENFIELD, Am. Clay Mach. Co., Bucyrus, O.
55. H. S. SIMPSON, Am. Clay Machinery Co., Chicago, Ill.
56. W. R. CUNNINGHAM, Am. Clay Mach. Co., Bucyrus, O.
57. H. L. HARMON, Am. Clay Machinery Co., Bucyrus, O.
58. WM. MERKLE, Am. Clay Machinery Co., Bucyrus, O.
59. ARTHUR PENFIELD, Am. Clay Mach. Co., Willoughby, O.
60. JAMES P. MARTIN, Am. Clay Mach. Co., New York, N. Y.
61. E. J. SHAW, Am. Clay Machinery Co., Seattle, Wash.
62. F. L. HOPLEY, Am. Clay Machinery Co., Bucyrus, O.
63. J. W. CARMICHAEL, Am. Clay Mach. Co., Willoughby, O.
64. FRANK SHANKLAND, Am. Clay Mach. Co., Willoughby, O.
65. LAMBERT HAIGH, Am. Clay Machinery Co., Bucyrus, O.
66. MRS. L. W. PENFIELD, Am. Clay Mach. Co., Bucyrus, O.
67. WM. E. SANKEY, Sankey Bros., Pittsburg, Pa.
68. C. C. HYATT, Richlands Brick Corporation, Richlands, Va.
69. JOS. T. McCLELLAN, Hotel McAlpin, New York City.
70. T. P. ELDRED, Am. Hard Wall Plaster Co., Utica, N. Y.
71. A. L. TERRY, Charles Engelhard, New York, N. Y.
72. S. C. LINBARGER, Carborundum Co., Niagara Falls, N. Y.
73. C. S. LINDER, Pittsburg Plate Glass Co., Creighton, Pa.
74. PAUL SCHULTZE, Secy. New York Pav. Br. Assn., Albany.
75. JOHN R. YOUNG, Merchants' Assn. of New York, New York.
76 ALFRED YATES, Bedford, Mass.
77. R. L. WINSLOW, Prudden-Winslow Co., New York, N. Y.
78. D. E. PRUDDEN, Prudden-Winslow Co., New York, N. Y.
79. W. P. BLAIR, Sec. Nat. Pav. Br. Mfrs. Assn., Cleveland, O.
80. G. H. CLIPPERT, G. H. Clippert & Bro. Br. Co., Detroit. Mi.
81. J. A. MERCIER, Mercier, Bryan & Larkins Co., Detroit, Mi.
82. WM. A. DAVIS, Nat. Assn. Marble Dealers, New York City.
83. H. H. MACDONALD, Nat. Pav. Br. Mfrs. Assn., New York.
84. DAVID W. JASPER, The Bonnot Co., Canton, O.
85. F. L. MANNING, Peebles Pav. Brick Co., Portsmouth, O.
86. E. J. MOORE, Richeson, Nelson & Moore, Greenville, O.
87. H. JEROME LEE, Fiske & Co., New York, N. Y.
88. R. W. NEWCOMB, Charles Engelhard, New York City.
89. ALFRED J. ROGERS, Fiske & Co., New York.
90. EDWIN ZORN, Brick & Clay Record, Chicago, Ill.
91. JOHN J. BISHOP, Memphis Brick Sup. Co., Memphis, Tenn.
92. C. P. WOOD, J. B. Owens Con. Tun. Kiln Co., Metuchen, N. J.
93. IRVING A. RYTTENBERG, Sumter Br. Wks., Sumter, S. C.
94. A. S. REID, A. S. Reid & Co., Newark, N. Y.
95. JAMES TONGUE, A. S. Reid & Co., Philadelphia, Pa.
96. E. J. SCHARIO, Keim-Brick & Tile Co., Louisville, O.
97. C. L. SAUTTER, Northampton Br. Co., Northampton, Mass.
98. O. W. WILL, Roessler-Hasslacher Chem. Co., P. Amboy, N. J.
99. A. ZAKHAROFF, Zakharoff, Petrograd, Russia.
100. FRANK McCLELLAN, Arnold-Creager Co., New London, O.
101. WM. H. TAYLOR, The New Jersey Co., New York City.
102. J. A. RIDGWAY, The J. D. Fate Co., Plymouth, O.
103. C. A. NICELY, Watsontown Brick Co., Watsontown, Pa.
104. CHRIS. STEADMAN, Steadman & Robinson, New York City.
105. JOTHAM POST, East Williston, L. I., N. Y.
106. WM. C. BLACK, Hay-Walker Brick Co., New York, N. Y.
107. A. A. AYERS, Hay-Walker Brick Co., New York, N. Y.
108. R. L. FINDLAY, Hay-Walker Brick Co., New York, N. Y.
109. FRITZ, SALMEN, Slidell, La.
110. H. FORRESTER, Veritas Firing System Co., Cleveland, O.
111. WARREN GRIFFISS, Baltimore Brick Co., Baltimore, Md.
112. E. R. JONES, Baltimore Brick Co., Winthrop, Maine.
113. H. A. McLAUGHLIN, Thew Automatic Shovel Co., N. York.
114. R. M. GATES, Thew Automatic Shovel Co., New York City.
115. ABEL HANSEN, Ford Porcelain Works, Metuchen, N. J.
116. HARRY HANSEN, Ford Porcelain Works, Metuchen, N. J.
117. L. U. NICKELL, Fulton Fire Brick Co., Fulton, Mo.
118. GRAFTON E. LUCE, Lambert Process Co., Chicago, Ill.
119. GEO. J. POTTS, C. & A. Potts & Co., Indianapolis, Ind.
120. O. C. KENNEDY, Cherokee Brick Co., Raleigh, N. C.
121. J. C. SEAWELL, Cherokee Brick Co., Raleigh, N. C.
122. JAMES F. JOHNSON, Johnson & Johnson, Raleigh, N. C.
123. A. R. D. JOHNSON, Cherokee Brick Co., Raleigh, N. C.
124. Z. V. PEED, Johnson & Johnson Co., Raleigh, N. C.
125. H. P. JENKS, Hook Patent Kiln Co., Columbus, O.
126. H. L. LONGNECKER, Hook Patent Kiln Co., Columbus, O.
127. J. A. MILLER, Rochester Clay Products Co., Rochester, Pa.
128. JOHN P. CAHOON, Salt Lake Press Br. Co., Murray, Utah.
129. J. H. RICHE, Piedmont Industries, Winston-Salem, N. C.
130. WALTER E. RUGGLES, Frost Mfg. Co., Boston, Mass.
131. OWEN TYLER, New York City.
132. RUSSELL A. BAILEY, Springfield Br. Co., Springfield, Mass.
133. FRANK E. WILES, A. M. & W. H. Wiles, Grassy Point, N. Y.
134. J. H. DOYLE, Eureka Brick Co., Norfolk, Va.
135. ROY A. HORNING, Armstrong Cork Co., Beaver Falls, Pa.
136. R. O. KEISER, Phila. Textile Mach. Co., Philadelphia, Pa.
137. HAROLD COPPING, Phila. Textile Mach. Co., Kankakee, Ill.
138. W. E. LOOMIS, Sherbrooke, P. Q., Canada.
139. WM. J. LEARY, W. J. Leary Mfg. Co., Buffalo, N. Y.
140. R. E. GOODRICH, Epping, N. H.
141. W. S. GOODRICH, Epping, N. H.
142. C. G. STEVENSON, The Stevenson Co., Wellsville, O.
143. THORN A. HIBBONS, Stevenson & Co., Wellsville, O.
144. DAVID B. GIBSON, Brick & Clay Record, Chicago, Ill.
145. H. S. HARRIS, Pennsylvania Fireproofing Co., Phila., Pa.
146. CHAS. W. WINSLOW, Board of Trade, Springfield, Mass.
147. J. F. BOOREAM, Am. Enam. Brick & Tile Co., N. Y. C.
148. LEE B. HUMPHREY, Brookville, Pa.
149. D. H. MILLER, Milton Brick Co., New York City.
150. L. E. RODGERS, L. E. Rodgers Eng. Co., Zanesville, O.
151. R. L. FRINK, The Frink Pyrometer Co., Lancaster, O.
152. E. W. DOW, E. M. Freese & Co., Pittsburg, Pa.
153. NED P. ELZEY, Parkersburg, W. Va.
154. WILLIAM C. KOCH, Twin City Brick Co., St. Paul, Minn.
155. S. G. WEBB, Nat. Fire Proofing Council, New York City.
156. G. S. BRUBAKER, H. Brewer & Co., Tecumseh, Mich.
157. A. A. OLDHAM, The Bonnot Co., Canton, O.
158. J. B. GERE, Onondaga Vitrified Brick Co., Syracuse, N. Y.
159. R. C. BENNETT, Wellington Machine Co., Wellington, O.
160. P. A. GOLARNEAU, Citadel Br. & P. B. Co., Quebec, Canada.
161. H. G. WHITMORE, Rochester Ger. B. & T. Co., Roch., N. Y.

162. H. K. NICKELL, Fulton Fire Brick Co., Fulton, Mo.
163. D. WARREN DE ROSAY, Corry Brick & Tile Co., Corry, Pa.
164. R. G. EISENHART, Consolidated Br. Co., Horseheads, N. Y.
165. EDWIN F. KNIGHT, Buffalo Clay Prod. Co., Buffalo, N. Y.
166. C. R. PEREGRINE, Macbeth Evans Gl. Co., Pittsburg, Pa.
167. T. M. RYAN, Allegheny Valley Brick Co., Olean, N. Y.
168. EDGAR J. BUTTENHEIM, The American City, New York.
169. H. J. WILEY, The Eastern Mach. Co., New Haven, Conn.
170. WM. CHELL, Brooklyn Vitrified Tile Wks., Brooklyn, N. Y.
171. F. A. HOILES, Alliance Brick Co., Alliance, O.
172. J. HOWARD TORREY, Thwing Instr. Co., New York, N. Y.
173. O. G. KNOSKE, Alliance Brick Co., Alliance, O.
174. WM. HANLEY, Bradford Pressed Brick Co., Bradford, Pa.
175. WM. HANLEY, JR., Bradford Fireproofing Co., Bradford, Pa.
176. H. S. HAMILTON, The McArthur Brick Co., McArthur, O.
177. L. W. SPRAGUE, The McArthur Brick Co., McArthur, O.
178. WM. CONWAY, Philadelphia, Pa.
179. WM. CONWAY, JR., Philadelphia, Pa.
180. E. C. HOWARD, Claycraft Mining & Brick Co., Columbus, O.
181. JOHN H. QUALMAN, Saginaw Pav. Br. Co., Saginaw, Mich.
182. A. R. ROOT, Chambers Bros. Co., Philadelphia, Pa.
183. STANLEY W. ROOT, Philadelphia, Pa.
184. J. W. SANDERS, U. S. Stamping Co., Moundsville, W. Va.
185. ROBT. J. DAWSON, The Barkwill-Farr Co., Cleveland, O.
186. J. H. RUBY, Barkwill-Farr Brick Co., Cleveland, O.
187. H. SCHMIDT, Roessler-Hasslacher Chem. Co., New York.
188. J. BARDUSH, Grand Rapids Refrigerator Co., G. Rap., Mich.
189. A. H. SHEPHERD, Shepherd Bros., Columbus, Ga.
190. GEORGE O. BERRY, Columbus, Ga.
191. J. F. REYNOLDS, Stiles & Reynolds Br. Co., N'th Haven, Ct.
192. CHAS. A. MILLAR, Price's Limited, Toronto, Ont., Canada.
193. WM. BURGESS, Don Valley Br. Wks., Todmorden, Ont., Can.
194. DANIEL E. RYAN, New York City.
195. ALFRED PETTIT, Chestnut Ridge White Br. Co., N. York.
196. R. T. HUTCHISON, Mack Mfg. Co., Philadelphia, Pa.
197. BAIRD MITCHELL, Mack Mfg. Co., Wheeling, W. Va.
198. HARRY W. SMITH, Roessler-Hasslacher Chem. Co., N. Y.
199. WERNER MALSCH, Roessler-Hasslacher Chem. Co., N. Y.
200. J. H. CHAMBERS, Chambers Bros. Co., Philadelphia, Pa.
201. W. E. DUNWODY, Standard Brick Co., Macon, Ga.
202. ARTHUR WHITCRAFT, Am. Mang. Steel Co., Pittsburg, Pa.
203. M. C. VIELE, North Adams Brick Co., North Adams, Mass.
204. D. B. ANDREWS, I. L. Stiles Son Br. Co., No. Haven, Conn.
205. CHESTER S. HART, Stiles & Hart Br. Co., Taunton, Mass.
206. JOHN T. HUMMERT, Gem City Press Br. Co., Quincy, Ill.
207. CHAS. C. STRATTON, Alumina Shale Br. Co., Bradford, Pa.
208. J. M. MOTT, Alumina Shale Brick Co., Bradford, Pa.
209. GEORGE A. PARRY, Parry Brick Co., Boston, Mass.
210. L. CLARK BENNETT, Parry Brick Co., Boston, Mass.
211. G. T. DICKOVER, Geo. T. Dickover & Son, Wilkesbarre, Pa.
212. W. S. DICKOVER, Geo. T. Dickover & Son, Wilkesbarre, Pa.
213. GEO. B. WAITE, Geo. T. Dickover & Son, Wilkesbarre, Pa.
214. GEORGE HYDE, Hyde & Son., Lts., Montreal, Canada.
215. A. GROSS, Hyde & Son, Lts., Montreal, Can.
216. E. A. CROSSLEY, The O. C. Barber Allied In. Co., Canton, O.
217. H. V. BRIGGLE, The O. C. Barber Allied In. Co., Canton, O.
218. EDWARD M. TAYLOR, Fiske & Co., New York City.
219. M. L. KREIDER, Becon, N. Y.
220. J. P. McLEAN, Excelsior Brick Co., Menominie, Wis.
221. G. W. McNEES, Kittanning, Pa.
222. JOSEPH T. BYRNE, Philadelphia, Pa.
223. H. H. OBERLY, Jas. B. Oberly, Wilmington, Del.
224. J. ADDISON CROWELL, J. B. Crowell & Son, Wallkill, N. Y.
225. W. L. BREWER, Roessler-Hasslacher Ch. Co., P. Amboy, N. J.
226. W. J. STEPHANI, O. W. Ketcham T. C. Wk., Philadel., Pa.
227. HOMER F. STALEY, Iowa State College, Ames, Iowa.
228. GEO H. BROWN, Rutgers College, New Brunswick, N. J.
229. H. O. STEELE, J. C. Steele & Sons, Statesville, N. C.
230. F. F. STEELE, J. C. Steele & Sons, Statesville, N. C.
231. D. W. COX, Manchester Shale Brick Co., Harrisburg, Pa.
232. JOS. K. MOORE, Robinson Clay Prod. Co., Dover, O.
233. JOHN W. REAGAN, Knoxville, Tenn.
234. ADOLPH HOTTINGER, Northwestern T. C. Co., Chicago, Ill.
235. LEVI MARSHALL, JR., Consolid'd B. Co., Horseheads, N. Y.
236. SAMUEL MARSHALL, Horseheads, N. Y.
237. GEO. C. HAMBLET, Hamblet Brick Co., Portland, Me.
238. WILLIAM LUCAS, Portland, Me.
239. W. W. SWENGEL, Bloomsburg, Pa.
240. W. S. GOODRICH, Epping, N. H.
241. M. S. LANKFORD, E. P. Elzey, Parkersburg, W. Va.
242. J. RICHARD EISENHART.
243. J. C. HARRIS, Manufacturers Equipment Co., Dayton, O.
244. B. H. RICHARDS, JR., Richards B. Co., Edwardsville, Ill.
245. KUNO B. SCHOTTE, Harry C. Grieme Co., Amsterdam, N. Y.
246. W. P. PHILLIPS, Phillips & McLaren Co., Pittsburg, Pa.
247. W. A. HOWELL, Collingwood Brick Co., Toledo, O.
248. W. C. ALWINE, Alwine Bros. Brick Co., New Oxford, Pa.
249. R. C. REYNOLDS, Saylorsburg, Pa.
250. W. C. SCHULTZ, Charles S. Schultz & Son, Hoboken, N. J.
251. WM. K. HAMMOND, JR., New York, N. Y.
252. ROMILY HAMMOND, John A. Philbrick & Bros., New York.
253. HAROLD HAMMOND, Wm. K. Hammond Co., New York.
254. H. L. McNEES, Kittanning Clay Mfg. Co.
255. J. H. MILLER, Washington B. & T. C. Co., Wash., D. C.
256. A. N. MILLER, Wash. B. & T. C. Co., Cleveland Pk., D. C.
257. WM. A. MILLER, Washington B. & T. C. Co., Wash., D. C.
258. R. O. CLARK, R. O. Clark & Son, East Berlin, Conn.
259. R. H. CLARK, R. O. Clark & Son, East Berlin, Conn.
260. JOHN W. HAHN, Boston, N. Y.
261. W. H. McCARTHY, Chicago, Ill.
262. PHILIP O'BRIEN, Verplanck, N. Y.
263. MATHEW GORMLEY, Montrose, N. Y.
264. S. P. MYERS, Robinson Clay Prod. Co., Uhrichsville, O.
265. L. E. DARLING, Thew Automatic Shovel Co., Lorain, O.
266. JAS. G. BEEMER, Chestnut Ridge White B. Co., New York.
267. D. LAWRENCE ASHER, H. Brown & Goerry Co., N. York.
268. T. E. WILSON, Penna. Clay Club, Pittsburg, Pa.
269. GEORGE W. WITMAN, C. K. Williams & Co., Easton, Pa.
270. W. L. PEERS, New York City.
271. CHARLES W. CRANE, Crossman So., South Amboy, N. J.
272. E. V. WAGNER, Wagner Fire Brick Co., Scranton, Pa.
273. E. A. CARROLL, H. C. Carroll & Sons, Philadelphia, Pa.
274. L. PERRY WEST, West Bros. Brick Co., Washington, D. C.
275. T. M. DOBBINS, Camden Pottery Co., Philadelphia, Pa.
276. R. A. MOORES, Duffney Brick Co., Mechanicsville, N. Y.
277. WILLIAM MASTERSON, New York City.
278. J. E. HALL, Adams Bros. Payne Co., Lynchburg, Va.
279. M. BLANCK, Central Conn. Brick Co., New Britain, Conn.
280. P. E. MONROE, P. L. Monroe & Son, Providence, R. I.
281. JAS. G. BEEMER, JR., Chestnut Ridge White Brick Co., N. Y.
282. JOHN A. NESBIT, Chestnut Ridge White Brick Co., N. Y.
283. WM. A. BAILEY, Northampton Br. Co., Northampton, Mass.
284. THOS. M. WILSON, Brick & Clay Eng. Co., Philadelphia, Pa.
285. CHAS. J. PIETSCH, Chestnut Ridge White Brick Co., N. Y.
286. WALDO A. TITSWORTH, N. Y. S. S. Claywkg., Alfred, N. Y.
287. C. H. MILLIGAN, Alfred University, Alfred, N. Y.
288. E. P. TROWBRIDGE, Montowese Brick Co., New Haven, Ct.
289. W. J. DEGENHART, John H. Black Co., Buffalo, N. Y.
290. H. S. LANGWORTHY, Jewettville B. Co., Orchard Pk., N. Y.
291. F. M. HARNSEL, John H. Black Co., Buffalo, N. Y.
292. S. B. DOBBS, Philadelphia, Pa.
293. G. H. TODD, The Park Brick Co., Hartford, Conn.
294. J. A. JUDD, New York, N. Y.
295. H. R. MEARS, Bloomsburg Brick Co., Bloomsburg, Pa.
296. C. C. MURRAY, Reynoldsville B. & T. Co., Reynoldsville, Pa.
297. PETER STIPP, Nay Aug Shale Brick Co., Scranton, Pa.
298. PETER STIPP, JR., Nay Aug Shale B. Co., Scranton, Pa.
299. BENJ. CLARK, JR., Am. Mang. Steel Co., Philadelphia, Pa.
300. E. G. BRICK, Clinton Metallic Paint Co., Clinton, N. Y.
301. H. A. PLUSCH, Abrasive Co., Philadelphia, Pa.
302. M. C. GREGORY, Brick, Terra C. & Tile Co., Corning, N. Y.
303. FRANK MOSS, Consolidated Brick Co., Horseheads, N. Y.
304. B. H. PEACOCK, Flemington Br. Wks., Flemington, N. J.
305. J. L. MURPHY, Hocking Valley Brick Co., Nelsonville, O.
306. E. B. AYRES, Philadelphia Textile Mach. Co., Phila., Pa.
307. J. S. VAN SICLEN, New York City.
308. STEPHEN KOLLER, Ochs & Frey B. Co., Allentown, Pa.
309. GUEST, KOLLER, Ochs & Frey Brick Co., Allentown, Pa.
310. D. L. GILLETT, Westfield Clay Prod. Co., Westfield, Mass.
311. C. B. HARROP, O. S. U., Columbus, O.
312. F. B. DUNN, Dunn Wire-Cut Lug Brick Co., Conneaut, O.
313. JOHN J. GOLDRICK, Phillip Goldrick, Kingston, N. Y.
314. PHILLIP GOLDRICK, Kingston, N. Y.
315. L. M. L. GOLDRICK, Phillip Goldrick, Kingston, N. Y.
316. MISS ASTRID S. ROSING, Chicago, Ill.
317. DAVID TERRY, Terry Bros Co., Kingston, N. Y.
318. THOS. F. GOLDRICK, Phillip Goldrick, Kingston, N. Y.
319. W. G. ROLAND, Schuylkill Valley Vit. Prod. Co., Oaks, Pa.
320. F. A. CHURCHILL, Dunn Wire-Cut Lug B. Co., Conneaut, O.
321. JAY TERRY, Terry Bros. Co., Kingston, N. Y.
322. JOHN J. FISH, Fiske & Co., New York City.
323. J. B. STONEKING, E. I. Dup. de Nemours Co., Wilm'gt'n, D.
324. JOHN W. KAMP, Fiske & Co., Boston, Mass.
325. H. R. CLARAGE, Clarage Fan Co., Kalamazoo, Mich.
326. H. C. DOWNER, The Malvern Fire Clay Co., Malvern, O.
327. WM. F. KANE, Michael Kane Brick Co., Hartford, Co.
328. WM. T. DABNEY, Richmond Chamb. Comm., Richmond, Va.
329. G. B. FORD, Conkling-Armstrong Terra C. Co., Phila., Pa.
330. H. F. KREIG, Midland Terra Cotta Co., Chicago, Ill.
331. V. M. PALMER, Charter Oak Brick Co., Elmwood, Conn.
332. E. G. PETZNER, Charter Oak Brick Co., Elmwood, Conn.
333. S. M. ARMSTRONG, New York City.
334. HUBERT SOMERS, Somers Brick Co., Atlantic City, N. J.
335. C. W. BERRY, Laclede Christy Clay Prod. Co., St. Louis, Mo.
336. W. Q. STARR, Starr & Wynn, Trafford, Pa.
337. C. H. BRYAN, Mercier, Bryan & Larkin, Detroit, Mich.
338. ALBERT LONYO, Lonyo Bros., Detroit, Mich.
339. HUBERT J. CONWAY, Montclair, N. J.
340. J. F. KREHBEIL, Advance T. C. Co., Chicago Heights, Ill.
341. M. MASON, Stone & Webster, Boston, Mass.
342. ROBT. J. MONTGOMERY, H. Koppers Co., Pittsburg, Pa.
343. LESLIE BROWN, Lenox Inc., Trenton, N. J.
344. GEORGE HAAF, Pass & Seymour, Inc., Solvay, N. Y.
345. SHUNICHI SHOFER, Student, Alfred Univ., Alfred, N. Y.
346. ERLING E. AYARS, Student, Alfred Univ., Alfred, N. Y.
347. J. W. GOODRICH, Jr., Piedmont Ind., Winston-Salem, N. C.
348. J. T. BRAMLETT, Enid, Miss.
349. ROSS C. PURDY, Norton Co., Worcester, Mass.
350. R. T. CLARE, Federal Terra Cotta Co., Woodbridge, N. J.
351. C. F. GEIGER, Ceramic Dep. Rutgers Coll., N. Brunsw'k, N. J.
352. LEWIS M. TUTTLE, Tuttle Brick Co., Middletown, Conn.
353. HORACE D. PAYNE, Tuttle Brick Co., Middletown, Conn.
354. ROBT. D. HAMILTON, Keystone Br. Co., Philadelphia, Pa.
355. HORACE M. SINER, H. M. & C. B. Siner, Philadelphia, Pa.
356. IRVING J. ROSE, Rose Brothers, Kingston, N. Y.
357. ALONZO K. ROSE, Rose Brothers, Kingston, N. Y.
358. H. J. JOVA, Jova Brick Works, Newburgh, N. Y.
359. F. S. NAUGLE, O. W. Ketcham, Philadelphia, Pa.
360. ELISHA K. KANE, Kushequa Brick Co., Kushequa, Pa.
361. E. S. MORSE, I. L. Stiles & Son Co., Wallingford, Conn.
362. F. L. MANSON, Pfotenhauer-Nesbit Co., New York City.

363. J. E. REYNOLDS, North Haven, Conn.
364. SAMUEL BANNELL, I. L. Stiles & Son Co., N. Haven. Conn.
365. R. J. MORRISSEY, J. J. King & Co., Grassy Point, N. Y.
366. JOHN J. KING, J. J. King & Co., Yonkers, N. Y.
367. WM. E. KING, J. J. King & Co., Verplanck, N. Y.
368. A. VOGEL, Thew Automatic Shovel Co., Philadelphia, Pa.
369. SIDNEY H. FRANCIS, Fitchburg Br. Co., Fitchburg, Mass.
370. E. W. KINGSBURY, Scandinavia Belting Co., Cleveland, O.
371. C. S. KING, Scandinavia Belting Co., New York City.
372. J. TOWERS, Towers Brick Co., New Britain, Conn.
373. FR. G. STROM, Montowese Brick Co., New Haven, Conn.
374. W. F. KROLL, Montowese Brick Co., New Haven, Conn.
375. P. R. KETCHAM, O. W. Ketcham, New York City.
376. ALEX S. BAIRD, O. W. Ketcham, New York City.
377. W. H. GUNNISS, Anaconda Copper Min. Co., Gt. Falls, Mont.
378. WALTER S. KETCHAM, O. W. Ketcham, Philadelphia, Pa.
379. A. J. HAMMETT, O. W. Ketcham, Philadelphia, Pa.
380. THOMAS R. RIKER, O. W. Ketcham, Philadelphia, Pa.
381. C. W. KING, Central Conn. Brick Co., New Britain, Conn.
382. W. N. CARY, Cary Brick Co., Albany, N. Y.
383. ROBT. H. WOBECKS, Upper Kittanning Brick Co., City.
384. WALTON N. COBBE, Walton N. Cobbe Co., New York City.
385. FRANK W. HELD, Ashaway Clay Co., Ashaway, R. I.
386. B. W. BROCKETT, Cleveland, O.
387. C. E. SCHILDKNECHT, Md. Br. & Sup. Co., Fred'k, Md.
388. H. H. ROSENBERG, Brick & Clay Record, Chicago, Ill.
389. E. J. HUTCHISON, Am. Clay & Cement Co., Rochester, N. Y.
390. C. E. WRIGHT, Amer. Clay & Cement Co., Rochester, N. Y.
391. F. B. QUINLAN, Kingston, N. Y.
392. T. G. McDOUGAL, Champion Ignition Co., Flint, Mich.
393. ARTHUR S. WATTS, Ohio State University, Columbus, O.
394. E. G. TREMPER, New York City.
395. HENRY T. WYNN, Wynn & Starr, Trafford, Pa.
396. E. W. KNAPP, Sun Brick, Ltd., Toronto, Ont., Canada.
397. JOS. P. TULLY, Chevalier & Tully, Baltimore, Md.
398. ELTON BRADDOCK, Somers Brk Co., Atlantic City, N. J.
399. HERMAN MUELLER, Mueller Mosaic Co., Trenton, N. J.
400. H. D. LOUNSBURY, Fredenburg & Lounsbury, New York.
401. EDWARD ORTON, JR., Ohio State Univ., Columbus, O.
402. A. V. BLEININGER, Bureau of Standards, Pittsburg, Pa.
403. CHARLES L. WALDUCK, Grueby Faience & Tile Co., Boston, Mass.
404. A. R. CAMPBELL, Metuchen, N. J.
405. J. F. MEEK, Altoona Brick Co., Altoona, Pa.
406. ENOS M. JONES, Altoona Brick Co., Altoona, Pa.
407. STACEY E. TUTTLE, Shawmut, Pa.
408. JOHN GIBSON, Shawmut, Pa.

Guest badges Number 601 to 730 were given to the ladies.

CONVENTION PERSONALITIES

MORE THAN ONE manufacturer expressed a mild surprise when told that New York is paying $12 a thousand for common brick; but one gentleman remarked that $12 a thousand when it costs $11, maybe, to make them, doesn't yield any more than $6 when the cost is $5. But the price is going up and $15 is predicted before new brick are ready for delivery.

Whenever automobilists in town through the Middle West enjoy running on smooth brick roads they should register suitable thanks to Will P. Blair, of Cleveland, secretary of the National Paving Brick Manufacturers' Association. No single man has done any more to popularize brick roads. His good work will be more apparent ten or fifteen years hence than it is now. His work in the convention this year was marked by the same clear-sighted common sense that always characterizes what he does.

William K. Hammond, of New York, acted very acceptably as toastmaster at the banquet. He was also a hard worker on the floor of the convention, and did not hesitate to express his mind upon the various topics under discussion. A forceful man, he is one of those who can be of vast use to the industry.

Charles B. Reinhart, of the Queen City Brick Company, Buffalo, expressed the opinion of all who came from that city, that Buffalo is only in her infancy. He doesn't have to worry about selling his brick, they put up buildings so fast in Buffalo that brick men have to sit up nights to study out ways to satisfy the demand.

In introducing ex-President Charles J. Deckman, of Cleveland, O., a gentleman referred to him as the best president the organization ever had. Perhaps friends of other ex-presidents will think this an unfair assertion, but it was made in good faith, and those who know all that Mr. Deckman has done may feel somewhat disposed to agree with that statement.

W. H. Taylor, of the New Jersey Company, proved himself an active member of the association. But he is an active business getter as well, and puts in practice in his regular business the methods he advocates on the floor of the convention. His company is located at Matawan, N. J., where it makes a superior quality of repressed brick. He is selling them, too, about as fast as the plant can turn them out. The combination of excellent quality with a superior salesman is developing a business worth while.

A. H. Shepherd and George O. Berry, both of Columbus, Ga., traveled a long distance to be present at the convention. Both are men who have seen the years pass with a good deal of equanimity. They sat side by side at the banquet, and it was a pleasure to hear them speak, their words were so soft and musical, characteristic of the region from which they came. They both reported good business and agreed that the convention in New York had no reason to feel overshadowed by any that went before.

Quite a number of the professors were in attendance at New York, including Prof. Orton, Prof. Binns, Prof. Washburn, Prof. Parmalee, Prof. Brown, Prof. Watts, Prof. Harrop and Prof. Staley. Of course, such ex-profesors as Messrs. Purdy, Bleininger and Stull were much in evidence.

A. Zakharoff, of Petrograd, Russia, was much interested in the convention, and spent much of his time acquiring information that might be useful at home. He told of important developments coming in his country after this war, and said that all mechanical processes like brickmaking will receive an immense impetus.

Two representatives were present from the Parry Brick Company, Boston, George A. Parry and L. Clark Bennett. They confided to their friends that if Boston keeps on growing they will have to enlarge their plant to keep up with the demand. The past year has seen a business done which exceeded anything that went before, and the promise for this year exceeds even last year. That portion of New England is evidently prosperous.

E. R. Jones, representing the Baltimore Brick Company, Winthrop, Me., was another New England man who insisted that he has the only state in the Union in which to live and do business. To be sure, when the winters were mentioned he was not quite so enthusiastic as he was about summer. His town is in Kennebec county, not far from important centers. It is an important manufacturing center, and the factories have patronized the brick men well. His statement that business is quite satisfactory was not qualified.

Lee B. Humphrey, of the Humphrey Brick and Tile Company, is one of those benefactors who make the wilderness to blossom as the rose. His home in Brookville, Pa., is literally carved out of a wilderness. Coming into possession of a tract of land covered with a hemlock forest, he, his father and an uncle have created a town. The timber was disposed of at a profit. Then they discovered natural gas. They established a clayworking plant for the purpose of utilizing their natural-gas supply. Then a glass factory fell into their hands. Now, around their various establishments has gathered a lively town of about 5,000 people, who look upon these industries as the salvation of the community. Mr. Humphrey had with him his daughter, who extracted great enjoyment from her first visit to New York. With talent above the ordinary, her parents are planning for her a career in music. He spoke enthusiastically of his business and its growth, and spent the time during the convention meeting and interviewing the representatives of his firm from various localities.

It always makes a crowd seem livelier and more enthusiastic when men like M. E. Gregory, of Corning, N. Y., are present.

The Detroit contingent consisted of Messrs. G. H. Clippert, J. A. Mercier and C. H. Bryan. Nothing really worth while escaped their attention.

Afred Yates, of Shawmut, Pa., was present at all the sessions and had time to consider things made out of clay, even though the papers were full of British victories.

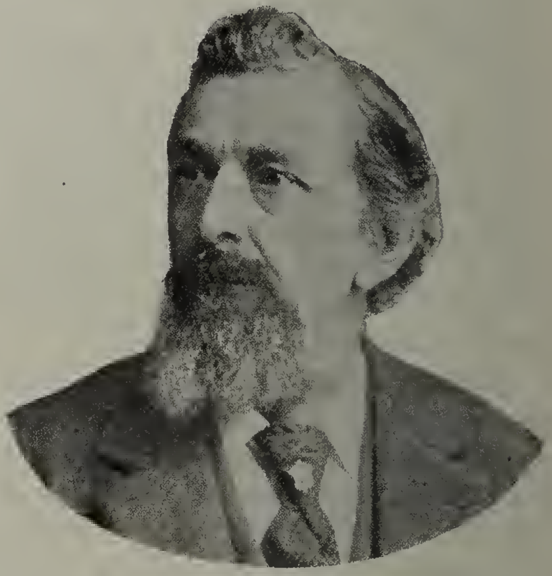
Jotham Post, of East Williston, L. I., N. Y., an active well-known eastern brick manufacturer, handed out with his compliments a clever card in the form of a match box holder.

The Keim Brick and Tile Company, of Louisville, Ohio, with his "Built with Brick" blotters and literature, was much in evidence. Mr. E. J. Schario wore the smile that won't come off while representing his company.

At Northampton, Mass., they make a very good quality of brick, even though the city is generally associated with ladies' colleges. Charles L. Sauter, representing the Northampton Brick Company, came down to tell his friends that his business has developed so fast he doesn't know what he is going to do with it. All that region is growing, and Massachusetts people are apparently decidedly partial to burned clay. At least one would gain that impression by hearing Mr. Sauter talk about what his company is doing. They have good beds of clay in the Connecticut valley to supply the raw material.

M. E. Gregory, Corning, N. Y.

Jotham Post, East Williston, L. I., N. Y.


John T. Hummert, Quincy, Ill.

John T. Hummert, secretary and superintendent of the Gem City Press Brick Company, Quincy, Ill., came on filled with all the usual Illinois enthusiasm. In fact, he radiated the particular brand they have always dispensed in Quincy and did not care who knew it. His card says that a brick will last always if made by John Hummert. It is certain that he enjoyed the smokerette, and, perhaps because he forgot his spectacles, he moved nearer the dance floor several times while the cabaret singers were performing.

Nathan H. Sloan, a hustling selling agent, whose place of business is in Paterson, N. J., was busy at the convention discussing conditions with the firms he represents and in making new connections. The net result of his attendance is the agency for a number of excellent makes of brick he did not have before. His territory is so near New York it is necessary for him to keep moving or be crowded out by some New York firm. But notwithstanding this partial handicap, he has a record for 1916 which the sellers anywhere will have hard work to surpass. Always on the job, the opportunity for a sale that escapes him has to move very rapidly.

C. P. Mayer, of the C. P. Mayer Brick Company, Bridgeville, Pa., ex-president of the N. B. M. A., enjoyed every moment of the convention and was an enthusiastic booster on all occasions.

Otto Bach, of the Bach Brick Company, Chicago, Ill., the only Chicago brick manufacturer present, never had a dull moment the entire week and was well satisfied with the work the N. B. M. A. is doing.

Wm. C. Black, Andrew Ayers and Robert L. Findlay represented the Hay-Walker Brick Company, of New York. They were kept busy attending the convention and expounding brick facts at their exhibit at the Building show.

Raleigh, N. C., was placed on the map by such live representatives as James F. Johnson and Z. V. Reed, of the Johnson & Johnson Company., and O, C. Kennedy, J. C. Seawell and A. R. D. Johnson, of the Cherokee Brick Company.

Springfield, Mass., is but eighteen miles below Northampton, and there the Springfield Brick Company is doing business. Russell A. Bailey was the company's representative. He confirmed all that Mr. Sauter said about Northampton, and declared that Springfield is taking to burned clay again, after some disposition to stray away from the solid moorings to which she anchored years ago, when some of her most substantial buildings were erected. Good business was the portion of his company during the year, and he looks for more of the same desirable growth this year.

Cecil Garden, Archie Reid and a number of the other "Beau Brummels" of the association were much in evidence and not only enjoyed all the festive occasion, but had time to get some real good orders for their companies. They were firm in the conviction that buttermilk mixes well with business boosting and a good appetite.

Thomas Wilson, of the Pennsylvania Clay Club, Pitts- very rapidly. Pittsburgh, from whence Mr. Wilson came to the club, he offered all the brick investigators may want in prosecuting their experiments with brick. It was the start of numerous offers that should solve one of the troublesome problems connected with the investigation. Mr. Wilson represented at the convention a large number of clayworkers who are progressive in their ideas and are in earnest in endeavoring to improve conditions in the industry. The club includes all the clayworkers of that state, where the industry is growing burgh, rather electrified the convention when, in the name of New York, is quite as much of a brick city as any in the country, and Pennsylvania brickmakers have contributed of their best material to make it so.

John P. Cahoon, of the Salt Lake Press Brick Company, came from Murray, Utah, to attend the convention. He said it was well worth the expense. He displayed to his friends a Build-with-Brick book his company was using in its campaign for bigger business.

R. E. Goodrich and W. S. Goodrich were present from Epping, N. H. Epping isn't a large place, but, even though that is true, it sent two very optimistic representatives, who are quite sure that business in their vicinity is destined to exceed anything hitherto known, this coming season. And they base their belief upon what was done last year and what is indicated by inquiries for this year.

So many express the opinion that conventions are useless and banquets and similar entertainments are a waste of time that a little story about this convention may not be amiss. At one of the small tables at the banquet sat seven persons. Two were from a Southern state, one was from Illinois, one from Vermont, another from New Jersey and two others from Pennsylvania. Probably those at other tables were even more widely distributed. But this goes to show how men from different parts of the country are brought together, and ever afterward, whatever may have been their opinions before, they will hold a pleasant memory of the men they met upon that occasion. It is well to read papers and make speeches regarding the business, but it is better to rub elbows with the other fellow and discover that he is a very decent individual after all.

John P. Cahoon, Salt Lake City, Utah.

George O. Berry, Columbus, Ga.

William Hauley, Bradford, Pa.

H. R. Clark was present from East Berlin, Conn. In that vicinity are a number of brick and tile plants, and his assertion that they haven't known what to do with the business that came to them during the year just passed can well be believed. The business has grown very rapidly of late and promises still further development in the future. Berlin and East Berlin are both prominent centers in the production of burned clay materials. They are likely to be better known in the future as business develops.

George Hyde, of Hyde & Sons, Ltd., Montreal, was about the convention early in the week. He was just from the trenches "somewhere in France," having been invalided home, and was on his way to Montreal. He held a good-sized audience interested as long as he would talk to them about life in the trenches. Many who heard acquired a new impression of what it is like. But somehow he has retained the spirit of the Canadian and seemed to convey the impression that worse things might befall than being forced to live in the trenches for a time. He didn't deny that Montreal will look very good to him, and he intimated that he will assume his work about the plant as soon as he is able, quite content to allow others to perform their part in the arduous duties that fall to soldiers in modern wars.

Mr. John W. Sibley, of the Southern Paving Brick Manufacturers Association, of Birmingham, Ala., perpetual treasurer of the N. B. M. A., was one of the early birds and deserves great credit for his loyalty, his enthusiasm and his untiring efforts in behalf of the clay industry in general. "Marse John" had all kinds of clever stories up his sleeve, as was revealed in his treasurer's report and his most admirable banquet speech. Don't forget also that he delivered a splendid illustrated address on brick-paved highways during one of the sessions.

Another incident illustrates that conventions are useful in a money way. There was a gentleman who saw nearly all the representatives of his firm at the gathering, and by going to a meeting of tile men in Rochester, N. Y., he figured that he would be able to see the others. In other words, by attending these two meetings he was able to see the men representing his firm, who are so widely scattered that, had he been obliged to go to the home of each of them, it would have consumed two months of his time. A little reflection will convince the most skeptical that an investment like this is well worth making.

The Canadian delegation consisted of W. E. Loomis, Sherbrooke, P. Q.; P. A. Golarueau, Quebec; Chas. A. Millar, Toronto; Wm. Burgess, Todmorden; George Hyde and A. Grass, Montreal; E. W. Knapp, Toronto. They paid close attention to the convention work, and did not miss any of the fun, either.

Wm. C. Koch, of the Twin City Brick Company, St. Paul, Minn., took an active interest in the work of the association, and it was he who started the ball rolling when he offered to contribute $100 to the publicity bureau. More power to the Twin City Brick Company. It has always proved to be for those things of deep interest to the trade.

The Wisconsin Red Pressed Brick Company, with yards in several cities, is representative of the brick producing interests of the state. At the present time great improvements are being made in its yards. The racks are undergoing complete rejuvenation and the kilns are being put in much better condition. The whole equipment is to be adjusted to an all-year run. That is representative of what Wisconsin brick producers think of the opportunity. And the builders keep right on saying, "More brick!"

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART X.

Fuel and Combustion.

IF CLAYWORKERS had a better understanding of the principles of combustion, there would be economy in fuel and likely better results. Combustion is simply another name for oxidation generally applied to rapid oxidation wherein the evolution of heat is sufficiently rapid to overcome radiation, convection and conduction losses and thus develop temperatures required in burning processes.

The usual combustibles are carbon, hydrogen and sulphur, but it may be a surprise to some to learn that there are many elements which may be classed as combustibles although ordinarily the rate of combustion is so slow that we call the process oxidation rather than combustion.

The operation of the Bessemer converter illustrates the combustion of elements not classed as combustibles, but which, under the Bessemer treatment, develop an intense temperature. Carbon burns out first, as would be expected, then follows the silicon and finally the iron itself, and it is to these elements that the converter owes its high temperatures.

In clay ware burning we are only concerned with the combustion of carbon, hydrogen and sulphur.

The combustion agent is oxygen, and it may come either from the air or from the minerals in the clay.

When we have reducing kiln atmospheres which we use to develop certain color effects, there are unburned or only partially burned gases which are seeking oxygen and which take oxygen from the minerals in the clay—reducing them, as we say. If we expose iron to an oxidizing atmosphere, it is converted into ferrous oxide, and finally ferric oxide; but if the latter is exposed to a reducing atmosphere, it gives up one molecule of its oxygen and becomes ferrous oxide, and the ferrous oxide may be reduced to iron; but ordinarily in clay wares the ferrous oxide readily fluxes with silica to form silicates of which there are several definite forms, and these are more difficult to reduce than the simple oxides.

The fuels are coal, as anthracite, coke, bituminous coal, and lignite; peat; wood; gas, natural and artificial; oil and oil residues.

Anthracite and coke are chiefly carbon, not considering the ash. Bituminous coal and lignite are made up of carbon and hydro-carbon. For example, if we enclose anthracite or coke in a crucible without air the temperature may be carried to an indefinite degree without materially lessening the weight of the anthracite. If bituminous coal or lignite is similarly subjected to heat, a gas is driven off which consists of hydrogen combined with carbon, while the residual coke which we called fixed carbon remains. Anthracite is practically all fixed carbon, but as we descend in the scale through semi-anthracites, semi-bituminous, bituminous, lignite, the fixed carbon decreases and the volatile hydro-carbons increase in volume.

Natural gas is a mixture of free hydrogen and hydrocarbons, though there may be at times a small percentage of the hydro-carbons in combination with oxygen.

Artificial gas, which is a distillate from coal, is largely hydro-carbon gases, while producer gas, which is derived from the imperfect combustion of coal, is a mixture of hydrocarbons and carbon oxides, the latter largely predominating.

Oils are hydro-carbons associated with oxygen, nitrogen and sulphur in combination.

Peat and wood have large percentages of cellulose, which is a hydrogen-oxygen-carbon combination.

While the composition of fuels is very complex, yet, in the processes of combustion it reduces to a few comparatively simple forms, and it is possible to approximately determine the value of the fuel by a formula applied to the ultimate composition of the fuel.

Carbon first burns to carbon oxide and the latter to carbon dioxide. If the combustion is complete, carbon dioxide is the resultant gas, and in such instances we need only consider it. Hydro-carbons break up and combine with oxygen to form water and carbon dioxide, and similarly the hydrogen-oxygen-carbons are finally resolved into water and carbon dioxide. Sulphur burns to sulphurous anhydride, which further oxidizes and combines with water to form a sulphuric acid.

It matters not what fuel we are burning, the resulting gases are carbon dioxide, water and sulphuric anhydride or acid. With these, of course, will be the nitrogen from the air, and free oxygen to whatever extent it is present in excess of the combustion requirement. If the combustion is incomplete as under reducing conditions, and especially in producer work, the gases will be hydrogen, hydro-carbons, carbon monoxide, carbon dioxide, water vapor, nitrogen and sulphurous acid.

Dulong's formula for the calculation of the value of a fuel from an analysis is as follows: $8080xC+34460x(H-\frac{1}{8}O)+2250xS=$calories, in which C equals carbon, H equals hydrogen, O equals oxygen, S equals sulphur.

A calorie is simply a measure of heat.

Unfortunately, there are several terms in use for the measure of heat units and considerable confusion arises in consequence. Values of fuels are usually given either in calories (c.) or British thermal units (b. t. u.) commonly called "heat units." Technical books, engineering hand books, etc., tell us that the calorie is 3.968 times the b. t. u. and herein we get confused.

As a matter of fact, the only difference is in the thermometer reading, and the calorie is 1.8 larger than the b. t. u., because it is measured in centigrade degrees instead of Fahrenheit. A heat unit is the heat required to raise a unit of water one degree from the maximum density temperature; a calorie is the heat required to raise one kilogram of water one degree centigrade; a b. t. u. is the heat required to raise one pound of water one degree Fahrenheit. On the basis of these definitions, which are correct, a calorie is 3.968 times a b. t. u., but we do not use the terms in that way, and the student who attempts such use of them gets into trouble.

A pound of fuel will raise the temperature of a pound of water to a certain number of degrees Fahrenheit, and this number of degrees is called the b. t. u. of the fuel.

We could use a kilogram, or a ton of fuel, to raise the temperature of a kilogram, or a ton of water, and we would get the same number of b. t. u.; but when we say that a given weight of fuel raises the temperature of an equal weight of water to a certain number of centigrade degrees, then the result is in calories.

The calorie and b. t. u. values as we use them are simply measures of temperature, and one can be converted into the other by the same factors that we use in converting centigrade into Fahrenheit.

We say that coal has a heat value of 8,000 calories, or 14,400 b. t. u., and the latter is 1.8 times the former, or we may divide the b. t. u. by 1.8 and have the result in calories.

Dulong's formula above given is in calories. It gives results very closely approximating the actual tests of the fuel for coals high in carbon, but varies considerably from the actual results where oxygen is a constituent of the fuel.

If the oxygen is combined with the carbon, the heating value will be higher than the formula determination. The formula assumes that the oxygen is combined with the hydrogen from which it is deducted, whereas it should be deducted from the carbon in the molecular ratio of C to O_2, to whatever extent it is in combination with carbon in the fuel. The heating value of the coal group is very closely approximated by the formula, and since this is the clayworker's chief fuel, modifications of the formula are not necessary for the clayworker's use. The Dulong formula is applicable to any coals, and clayworkers may determine the relative value of their fuels by this formula.

A high percentage of sulphur is always objectionable, in that it usually involves a corresponding high percentage of iron which readily combines with the silica of the ash to form clinker. It matters not what the heating value of the fuel may be, the value depreciates if the ash fluxes and shuts off the air supply and requires additional labor to keep the grates in condition for good combustion.

Anthracite is a very dense fuel, and in consequence does not burn radily. It is necessary to maintain a deep bed of the fuel on the grates in order to offset radiation losses and the cooling effect of the entering air. The air enters through the grates, and in its initial contact with the glowing coals the oxygen takes up carbon and carbon dioxide is formed ($C\ O_2$), but as this gas rises through the bed of fuel, it is reduced to carbon oxide (C O). Whether that is the exact reaction or not is of no importance. We know that we have escaping from the top of the fuel bed carbon dioxide, carbon monoxide and nitrogen, besides some water vapor and a little sulphurous anhydride.

The carbon dioxide is a final product, but the carbon monoxide is still a combustible gas. This is the mixture we get in producer gas, and the purpose of the process is to produce as little carbon dioxide and as much carbon monoxide as possible. Anthracite coal is especially valuable in the production of producer gas, in that the gas carries very little tar products and sulphur and is largely carbon monoxide.

In the grate operation the combustion is completed by the admission of secondary air over the top of the bed of glowing coals. Many furnaces have been devised in order that the secondary air introduced shall be heated before it enters the combustion chamber, because cold air chills the gases below the ignition point. We are accustomed to regard combustible gases as explosive and err in regard to the ignition point. They require higher temperature for ignition than wood or coal.

At low temperatures carbon monoxide cracks to form carbon dioxide and carbon, and the carbon thus formed does not readily combine with oxygen, but instead passes off as smoke or builds up carbon deposits in the furnace regardless of temperature and excess of air.

L. Babu, "Traite' de Metallurgie Generale" is authority for the statement that carbon monoxide dissociates into carbon dioxide and carbon almost completely at 450 degrees C. (842 degrees F.), but the dissociation is almost zero at 1,000 degrees C. (1,832 degrees F.). In order then to get the full benefit of the combustible gas rising from the bed of coals, it is essential that the air introduced for secondary combustion be preheated in order to maintain a high furnace temperature.

The fuel bed for anthracite must be deep for reasons already given, and also because the coal does not swell in burning, but, on the contrary, as combustion proceeds, there is a shrinkage in volume and a gradual settling down of the bed, which, if shallow, would soon develop holes through which an excess volume of air would pass, at the same time robbing the deeper portions of the fuel bed. An extreme condition would be a number of large holes (black spots) through which a large volume of air is passing, while the limited volume of air passing through the hot coals would develop a small amount of carbon monoxide, and the result would be a large excess of air which would have to be heated at the expense of the limited volume of carbon monoxide, and in consequence the furnace temperature would be low.

Herein is the cause of a great loss to clayworkers, especially in the operation of down-draft kilns.

They are trying to heat a large volume of air in competition with the sun, without any return in hardening the wares in the kilns.

Anthracite is a short flame fuel, and because of its density it is slow burning. On account of the latter factor, in order to consume the oxygen from the air and get temperature results, it is necessary to expose a large surface of the fuel to combustion conditions, and this means a deep bed of fuel.

The products of combustion from a shallow bed will be carbon dioxide, oxygen and nitrogen; from a deeper bed, carbon dioxide and nitrogen; from a very deep bed, carbon dioxide, carbon monoxide and nitrogen. The first result is wasteful in fuel; the second is difficult to obtain and maintain; the third requires secondary air to complete the combustion, and when carried to an extreme is a gas producer condition.

In order to avoid the first condition we tend toward the third, and many of our furnaces are crude gas producers, particularly the inclined grate bar and grateless furnaces.

The average temperature of the surface of a bed of hard coal is higher than that of bituminous coal, because the moisture and volatile gases to be dissociated are much less, and in consequence the heat which becomes latent in this combustion of the bituminous coal is available as sensible heat in the combustion of the hard coal. The gases arising from

(Continued on page 298.)

MEETING OF AMERICAN CERAMIC SOCIETY

A RECORD BREAKING ATTENDANCE, A SERIES OF ABLE PAPERS AND INTERESTING SIDE TRIPS MAKE MEMORABLE THE MEETING IN NEW YORK CITY

THE NINETEENTH ANNUAL MEETING of the American Ceramic Society, held at the Astor Hotel, New York City, March 5th to 8th, was a very thoroughly successful convention. The registration showed 175 ceramists were present, which was about 25 better than the best previous attendance. The sessions were held in the College Room, on the eighth floor of the hotel. This was a fair sized room, which was comfortably filled from the start to the end of the convention.

The first session was called to order by President Barringer, Monday morning, March 5th, at 10:00 a. m. The report of the Board of Trustees showed that the society had a small increase in growth, there being 79 accessions, 58 losses, making a net growth of 21. The loss in membership was in foreign members and due entirely to the great war going on.

The report of the Treasurer showed a very successful year, there being a net increase of $450 over that of last year, due to the increased sale of the Society's literature. The Board of Trustees reported the formation of two new student branches, those of the Iowa and Illinois universities. Obituary notices on the death of L. B. Coulter and Chas. Whelans were read. The Society joined the Joseph J. Jones Safety Association, the purpose of which is the upbuilding of safety in manufacturing institutions. The Society expressed the earnest desire to do everything possible to increase safety in the clay industry. The association is also preparing to join the National Fire Prevention Society of Boston.

President George H. Brown,
New Brunswick, N. J.

President Barringer, in his address, devoted same to a very thorough study of the development of the American Ceramic Society and ways of increasing its effectiveness and prestige. The address resulted in the selection of a committee on membership, a committee on standards and a committee on military preparedness.

At the Monday afternoon session, the regular program was taken up and the reading of the papers began. In the several sessions held, twenty papers were read, devoted to heavy clay wares, their manufacture and testing, the titles of which were:

- "Study of Effect of Variation of Pressure in the Forming of Dust Pressed Tiles," Forrest K. Pence, Zanesville. O.
- "The Advantages of Clay Storage and a Description of a Successful Installation" (illustrated), F. A. Riddle, U. S. Bureau of Standards, Pittsburgh, Pa.
- "Notes on the Manufacture of Promenade Tile," Marion W. Blair, Thornton, W. Va.
- "Notes on the Flow of Clay Through Hollow-ware Dies," George D. Morris, St. Louis, Mo.
- "Humidity: Its Control and Relation to Drying Clay Wares," Walter Angus Denmead, Schenectady, New York.
- "The Effect of the Size of Grog in Fire Clay Bodies," F. A. Kirkpatrick, U. S. Bureau of Standards, Pittsburgh, Pa.
- "The Relation Between the Fusion Point and Composition of Refractory Clays," R. J. Montgomery and C. E. Fulton, Pittsburgh, Pa.

Ancient Glazed Tile Made During the Ming
Dynasty, Seen at Metropolitan Museum.

- "Volume Changes of Some Quartzites and Commercial Silica Bricks on Heating," Donald W. Ross, U. S. Bureau of Standards, Pittsburgh, Pa.
- "Note on the Fine Grinding or Refractory Materials Before Testing," R. J. Montgomery, Pittsburgh, Pa.
- "Relation of Fusing Point of Ash to Availability of Coal for Burning Ceramic Wares," R. R. Hice, Beaver, Pa.
- "An Attempted Heat Balance on a Continuous Kiln," Carl B. Harrop, Columbus, O. (By permission U. S. Bureau of standards.)
- "Making Paving Brick from Blast Furnace Slag," J. B. Shaw, Alfred, New York.
- "The Principles of Construction of Bucket Elevators," George D. Morris, St. Louis, Mo.
- "Modification of Load Test on Fire Brick," J. B. Shaw, Alfred, N. Y.
- "Causes for the Failure of Terra Cotta in the Wall," R. L. Clare, Woodbridge, New Jersey.

"The Effect of Reduction During Burning upon Certain Shales," C. W. Parmelee, Urbana, Ill.

"An Unusual Cause of Scaling of Sewer Pipe," C. W. Parmelee, Urbana, Ill.

"Note on Shiver in a Terra Cotta Body," Gail R. Truman, St. Louis, Mo.

"The Development of the Decorative Processes in Ceramics," Frederick H. Rhead, Santa Barbara, Cal.

"The Place of Practical Ceramics in Industrial Education," George C. Greener, Boston, Mass.

"A New System of Making Terra Cotta Molds," Rufus B. Keeler, National City, Cal.

"A Study of the Effect of Variation in Pressure and Moisture in the Forming of the Dust Pressed Tiles," F. W. Walker, Jr., and E. G. Kerr, Beaver Falls, Pa.

"Construction of By-product Coke Oven" (a talk illustrated by lantern slides), R. J. Montgomery, Pittsburgh, Pa.

"The Influence of Different Materials Employed as Sources of Lead Oxide, upon the Physical Properties of Glazes Before Firing," Fred A. Morgan, Chicago, Ill.

Of special interest were the papers by Messrs. Riddle, Blair, Dennead, Kirkpatrick, Hice, Harrop and Shaw. There were eleven papers dealing with the subject, "Raw Materials, Minerals: Their Occurrence, Refining and Testing," namely:

Quaint Chinese Tile Gargoyle, Courtesy Metropolitan Museum of Art.

"Notes on the Use of Sulphuric Acid in the Sedimentation of Kaolins," H. G. Schurecht, U. S. Bureau of Mines, Columbus, Ohio.

"Notes on Kaolin Refining," Ira E. Sproat, Macon, Ga.

"American Clays for Floating Enamels," J. B. Shaw, Alfred, N. Y.

"The Relation of Salt to Clay in the Purification of Clays," H. G. Schurecht, U. S. Bureau of Mines, Columbus, Ohio.

"A Study of Some American Refractory Bond Clays," A. V. Bleininger and G. A. Loomis, U. S. Bureau of Standards, Pittsburgh, Pa.

"Clay and Shale Deposits in the Vicinity of Toronto," Ernest W. Knapp.

"Apatite: A Substitute for Bone Ash," N. B. Davis, Ottawa, Canada.

"An Instrument for the Measurement of Plasticity," W. E. Emley, U. S. Bureau of Standards, Pittsburgh, Pa.

"Discussion on Standard Methods of Clay Testing," led by A. V. Bleininger, U. S. Bureau of Standards, Pittsburgh, Pa.

"A Method of Measuring the Time of Set of Calcined Gypsum," W. E. Emley, U. S. Bureau of Standards, Pittsburgh, Pa.

"Magnesite in Grenville District of Canada," Dr. M. E. Wilson, Ottawa, Canada.

Of particular value were those by Messrs Schurecht, Shaw, Bleininger, Loomis and Emley.

There were six papers under the head of "Glass and Enamel Industries," namely:

"Glass Sands: Their Origin, Mode of Occurrence and Properties," Charles R. Fettke, Pittsburgh, Pa.

"The Physical Chemistry of the Firing of Glass," Raymond M. Howe, Pittsburgh, Pa.

"Glass Tank-Furnace Operation," R. L. Frink, Lancaster, Ohio.

"History of Alabaster Glass," Alexander Silverman, Pittsburgh, Pa.

"Topic for Discussion: In What Chemical Condition Does Manganese Exist in Glass When Used as a Decolorizer, and What Factors of Furnace Conditions Affect It?" Discussion led by R. L. Frink, Lancaster, Ohio.

Secretary Edward Orton, Jr., Columbus.

"Enamel Surfaces Under the Microscope," Emerson P. Poste, Elyria, Ohio.

There were ten papers under the head of "Glazes and Colors," titles of which were as follows:

"The Cost of Raw Lead Glazes," Homer F. Staley and Lowell Hewitt, Ames, Iowa.

"Chrome-tin Colors at Cone 9," R. H. Minton, Perth Amboy, New Jersey.

"A Synthetic Production of Sulphate Blisters in White Ware Glazes," Charles F. Binns, Alfred, N. Y.

"A Study of Three Component Nomative Systems in Raw Lead Glazes," Homer F. Staley and W. G. Whitford, Ames, Iowa.

"The Crawling of Matt Glazes," C. F. Binns and Mary S. Saunders, Alfred, N. Y.

"Bristol Glazes, Compounded on the Eutectic Basis" (second paper), Arthur S. Watts, Columbus, Ohio.

"The Control of Fusibility in Fritted Glazes," Homer F. Staley and R. J. Riley, Ames, Iowa.

"Report of Practical Application of Bristol Glazes Compounded on the Eutectic Basis," Arthur S. Watts, Columbus, Ohio.

"The Influence of Different Materials Employed as Sources of Lead Oxide upon the Physical Properties of Glazes Before Firing," Fred A. Morgan, Chicago, Ill.

"Burning Properties of Some American Refractory Clays," H. G. Schurecht, Columbus, O.

Those receiving special attention were by Messrs. Minton, Staley, Binns and Watts.

The following papers were read when the matter of Ceramic Bodies and their properties were under discussion:

"Notes on Flint and the Preparation of Porcelain Bodies," G. H. Brown and C. F. Geiger, New Brunswick, N. J.

"The Interchange of Quartz and Flint in Pottery Bodies," Charles F. Binns and Willard I. Sutton, Afred, N. Y.

"A Deformation Study of $MgO-Al_2O_3-SiO_2$ Mixtures," Arthur S. Watts, Columbus, Ohio.

"A Deformation Study of $BaO-Al_2O_3-SiO_2$ Mixtures," Arthur S. Watts, Columbus, Ohio.

"Latent Heat of Fusion of Lime and Magnesia," E. W. Washburn, Urbana, Ill.

"A New Principle in Heat Measurement," W. C. Harter, Trenton, N. J.

"Note on the Temperature-Porosity-Volume Changes of Some Porcelain Bodies," G. A. Loomis, U. S. Bureau of Standards, Pittsburgh, Pa.

"Note on the Production of Special Refractories, Marquardt Porcelain and Magnesium Aluminate," F. H. Riddle, U. S. Bureau of Standards, Pittsburgh, Pa.

"The Relation of Porosity of the Body and Density of the Glaze in the Application of Matt Glazes," F. S. Hunt, Beaver Falls, Pa.

The papers by Messrs. Brown, Geiger, Binns, Sutton, Harder, Loomis and Riddle were of chief value.

The session held Tuesday afternoon at the Metropolitan Museum of Fine Arts was most entertaining and enjoyable. A lecture on "Ancient Greek Pottery" was given by Miss Richter, Curator in Department of Classical Arts. This was a very admirable talk, illustrated with lantern slides. It was followed by an address by Prof. C. F. Binns, of Alfred, N. Y., who detailed the methods and results of a series of experiments for reproducing ancient oriental glaze pottery. He had the trials with him to show what he had accomplished in this respect. Prof. Edward Orton, Jr., Columbus, Ohio, gave a lecture on the subject, "An Indigenous American Artist and His Medium." He showed in lantern slides about thirty pieces of carvings, mostly in the form of smoking pipes, made by the mound builders of Ohio, probably about a thousand years ago. In describing these pieces, he stated that these carvings were of an order of merit absolutely new to the American races, and the material from which the pieces were carved was a flint fire clay and unburned. These pieces were excavated in southern Ohio, and a thorough study brought forth the fact that although these are in perfect condition, they are of great antiquity, and the work of an old Indian who had greater skill in copying from life than a great many of our artists of today. This information was procured from W. C. Mills, Curator of the Ohio Archealogical Historical Society of Columbus. Following this lecture, a trip was made through the department of Greek Arts. Miss Richter called attention to and explained the important points.

This was followed by a trip through the Department of Chinese Porcelain, with Curator Bosch Reitz, of the Department of Oriental Arts, as guide.

Monday evening a Section Q meeting was held in the College Room of Astor Hotel, during which motion pictures of the Federal Terra Cotta Company's plant and the Plattsburg movement for military service were shown, the first explained by R. L. Clare and the latter by Prof. Edward Orton, Jr. These were intensely interesting. Reports from all the student branches were heard, including those of the Ohio, New York, Ilinois, Iowa and Beaver Section. Suitable refreshments were served to members during the remainder of the evening.

The last session closed Wednesday afternoon with the following business: The election of officers—President, George H. Brown, New Brunswick, N. J.; Vice-President, C. Edward Jackson, Wheeling, W. Va.; Secretary, Edward Orton, Jr., Columbus, Ohio; Treasurer, Ralph Hursh, Urbana, Ill., and Trustee for 1917 to 1920, E. T. Montgomery, Detroit, Mich.

The following men were promoted from associate to active membership: W. A. Dennead, Schenectady, N. Y.; Carl B. Henderson and Carl B. Harrop, Columbus, Ohio; E. C. Hill, New York; W. L. Howat, Perth Amboy, N. J.; C. J. Kirk, New Castle, Pa.; E. P. Post, Elyria, Ohioi; F. W. Walker, Jr., Beaver Falls, Pa.; J. W. Ward, Derry, Pa.

The following were nominated to active membership for next year: N. B. Davis, Ottawa, Can.; Marion W. Blair, Thornton, W. Va.; Geo. W. Morris, St. Louis, Mo.; F. A. Kirkpatrick, Pittsburgh; H. G. Schurecht, Columbus, Ohio; Raymond M. Howe, Pittsburgh, and Robert L. Clare, Woodbridge, N. J. Sixty-five men from all parts of the country, including England and Japan, were elected to associate membership.

A committee was appointed to consider the possibility of establishing a technical journal. Committees were also appointed to arrange for the next mid-summer meeting and one on military and industrial preparedness was created.

Thursday, March 8th, under the guidance of Mr. R. H. Minton, C. A. Bloomfield, August Stoadt and Abel Hansen, the ceramists went on the New Jersey Central railroad to Perth Amboy, which they reached at 9:15, and went at once to the Atlantic Terra Cotta Company's plant, where they were shown through every department. The inspection tour, lasted until 10:45. The crowd then went by trolley to the A. Pardee Tile Company's plant, where they were shown the manufacture of wall and floor tile. The delegates took lunch at the Elks' Club as guests of the guides. In the afternoon, they went by trolley to the Fords Porcelain Company, where they carefully studied the manufacturing of sanitary pottery. The last stop of the day was at the plant of the Didier-March Company, where they were shown the big Altwasser tunnel kiln and a very fine equipment for grinding and preparing clay. The party then broke up at Perth Amboy, some going home and others returning to New York to take in the N. B. M. A. convention and to spend further time in sight seeing.

BRICKMAKERS OF THE NORTHWEST ORGANIZE FOR PUBLICITY CAMPAIGN.

To advertise the brick industry of the Twin Cities and to show the value and possibilities of this material in fireproof construction and ornamental architecture, the Northwest Face Brick Association has been organized and filed articles of incorporation with Julius A. Schmahl, secretary of state. state.

Headquarters of the association, composed of leading brick dealers in the two cities, will be in St. Paul.

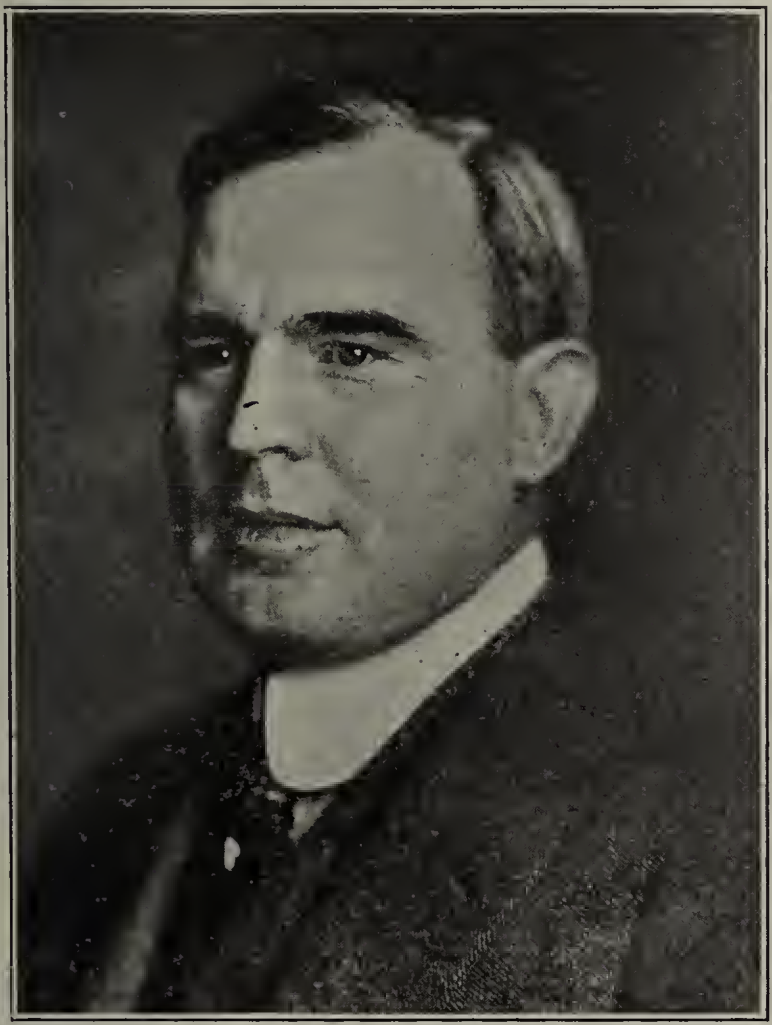
A campaign of advertising will be undertaken by the association throughout the Northwest. Dealers in other building materials have formed similar organizations to advance the sale of concrete, lumber and such material, and because of the competition which has arisen brick dealers decided to do likewise.

John H. Donohue, Jr., and John T. Harrington, of St. Paul, and Edward H. Cobb and Ferris H. Martin, of Minneapolis, are among the incorporators.

THE N. P. B. M. A. MEET AND CONSIDER A WIDER FIELD FOR THEIR PROMOTION AND PUBLICITY WORK

A QUARTERLY MEETING of the National Paving Brick Manufacturers Association was held at Hotel McAlpin, New York City. It was called to order Monday, March 5th, and remained in session the entire afternoon. The program consisted in following for the most part the regular order of business as provided in their constitution.

The Executive Committee reported in favor of the same yardage assessment for the support of the association, as has prevailed for several years past. Progress reports of the activities of the Association were submitted and approved by the Association. Every feature of the business as reported from different parts of the country was most gratifying, with the exception of the difficulties which seem to prevail common to all industrial efforts. The scarcity and discontented condition of labor, as well as the lack of cars and power, connected with transportation, are hindrances which are expected to handicap the industry to a greater or less extent in the future, but the harmony and united spirit of the manufacturers which was evident on all hands, is expected to overcome in a large measure their difficulties.



C. C. Blair, Canton, O., President N. P. B. M. A.

As the organization grows older in experience, the worth of same becomes more and more appreciated in the increased confidence that is established among the manufacturers. As the progress in the betterment of conditions among the membership grows, they are likewise extending their influence with the public.

The most notable characteristic of the Association is that every day and every year its influence and efforts are widened. At this meeting they arranged to extend their advertising efforts to reach a larger number of the general public. The advertising in the farm journals of the country will be undertaken modestly, but progressively, showing the advantages of the use of paving brick for improving public highways. At least five such publications will be used this spring.

Reports from various sections of the country leave the impression that a larger mileage of country highways is to be improved in 1917 than ever before. Brick paved highways are no longer being confined to a few states. It is confidently expected that the year 1917 will see brick roads built in nearly every state of the Union. The disposition of the public to favor brick paved highways has been greatly augmented through the more determined efforts in the past of the National Paving Brick Manufacturers Association to exercise a careful supervision over the way in which brick roads are built. The manufacturers are more in accord than ever with the belief that the largest and ultimate development of the industry is to be reached through the proper use by the public of the product. This feature of the effort on the part of the Association and the manufacturers of paving brick has been met in a kindly spirit by the public and engineers of this country. The industry, therefore, looks very hopefully toward a more complete belief that brick roads are to furnish the economical transportation of commodity needs that the railroads are now unable to supply. The story of providential favor in freezing the roads in a smooth condition for a few days during the past winter, so that the hogs could really enjoy their ride to death in auto trucks over roads temporarily provided for a few days, may be brought into real existence for everyday use for years to come by the exercise of common sense and the proper use of paving brick for the permanent improvement.

The meeting was enlivened by a personal message from a representative of the Russian Empire, telling of the conditions and the demand for good roads in that far-away country. The members were further delighted to welcome into their membership in their association of world wide influence a paving brick manufacturer of South Africa.

TWO BIG PAVING BRICK COMPANIES MERGED.

One of the largest, if not the largest, deals to be consummated this year in the clayworking field is that which was closed March 1 when the Metropolitan Paving Brick Company, of Canton, Ohio, purchased the paving brick plant and interests of the Bessemer Limestone Company, of Youngstown, Ohio, and Bessemer, Pa., thereby increasing the already large capacity of the Metropolitan Company until it is now without question the largest paving brick concern in the world, for in addition to these plants, the company also owns a large plant at Moberly, Mo. By terms of the purchase the Metropolitan Paving Brick Company acquired the mammoth brick kilns and property of the Bessemer company, including hundreds of acres of paving brick shale at Bessemer, Pa. The purchase was under consideration for several months and involved considerably over $1,000,000. The reorganization of the Metropolitan Company is not completed as yet, the officers have not been announced. However, C. C. Blair, for many years general manager of the Bessemer Company, at Youngstown, will be general sales manager with headquarters at Canton, and a goodly number of the men who have been connected in an official capacity with the Bessemer paving brick department will become a part of the new organization. Fred R. Kanengeiser, the superintendent of the Bessemer paving brick plant, retires to take charge of the limestone business of the Bessemer Limestone Company, at Youngstown, and R. C. Wallis, who has been Mr. Kanengeiser's assistant for the past seven years, has been promoted to the superintendency of the paving brick plant at Bessemer. Prior to the change the officers of the Metropolitain Company were, president, C. W. Keplinger; vice-president, W. E. Keplinger; secretary, J. G. Barbour; treasurer and general manager, H. S. Renkert; general superintendent, O. W. Renkert, with A. P. Maurer as general manager of sales.

MONOLITHIC BRICK PAVEMENTS

BY FLOYD ALLEN.

PART II.

UP TO a few years ago it was customary to put transverse expansion joints in brick pavements at regular intervals. Many engineers are advocating the elimination of this practice and a great many miles of roads and streets have been laid without the use of expansion joints in the last few years. This practice of eliminating transverse expansion joints, to my mind, is a doubtful improvement in general practice.

A pamphlet issued by the government upon vitrified brick pavements, by Messrs. Pierce and Morfield, advised the elimination of the transverse expansion joint, and still advocates the longitudinal expansion joints at the curb. This longitudinal expansion joint is to eliminate an arch in the pavement crown, but the pavement is left to take care of its own internal stresses for its entire length. This may be accomplished where the pavement is comparatively level, the grade unbroken, and the two ends held rigidly in place. It may work for a short distance, but in a pavement of any length, the expansion would become quite great, and either the sustaining resistance on either end of the pavement, or the grout in the brick must fail by compression—invariably it is the latter.

There was involved in the series of tests made at Renton an experimental test on expansion of a vertical fiber brick beam set on edge, 15 bricks long and 2 bricks wide, bricks grouted with 1-1 mixture; also a monolithic brick constructed beam with 1-2-4 base, 4 inches thick, one-half inch mortar bed, and vertical fiber brick laid flat, grouted 1-1. The relative length of these beams was approximately 10 feet, 11 inches.

In making these tests, extreme care was used to eliminate error that might creep in on account of expansion or contraction of the measuring bar between hot and cold measurements. The bar was cased in heavy layers of asbestos, and only the points and the micrometer were exposed to the changes of temperature subjected to the beam under test, and bar being kept outside the room where the testing was being conducted.

Expansion Tests.

Measurements were made after the test pieces had been thoroughly cured under damp sand.

Brick Beam, Grouted:

Beam made of the "Vertical Fiber" brick, set on edge, 15 bricks long and 2 bricks wide. Bricks grouted with 1-2 mixture.

Total length cold	131.17 in.
Temperature when cold measurement made	0.0 deg. C.
Hot temperature	95.5 deg. C.
Range in temperature	95.5 deg. C.
Micrometer reading at cold measurement	0.6171 in.
Reading at hot measurement	0.7007 in.
Total expansion	0.0836 in.
*Coefficient of expansion per deg. C.	0.00000665*
*Coefficient of expansion per deg. F.	0.00000369*

Monolithic Beam:

Under brick surfacing "Monolithic" Construction.

Base of 1-2-4 concrete 4 inches thick; mortar bed, 1 cement, 2 sand, ½ inch thick; surface, "Vertical Fiber" brick laid flat and grouted with 1-1 mixture.

Total length cold	132.0 in.
Temperature when cold measurement made	0.0 deg. C.
Hot temperature	99.0 deg. C.
Micrometer reading at cold temperature	00.6674 in.
Micrometer reading at hot temperature	00.7533 in.
Total expansion	00.0859 in.
*Coefficient of expansion per deg C.	0.00000677*
*Coefficient of expansion per deg. F.	0.00000365*
Expansion per 1 deg. F. for 100 ft.	.00438 in.
Expansion per 100 deg. F. for 100 ft.	.438 in.
Expansion per 1 deg. F. for 5,280 ft.	.2324 in.
Expansion per 100 deg. F. for 5,280 ft.	23.24 in.

The expansion of concrete given by Taylor & Thompson is .0000055.

Expansion of brick masonry given by Fry's Hand Book is .0000037.

It is to be noted that the expansion of the brick of the monolithic construction is almost identical with that of the brick beam.

Compression by Expansion.

The expansion of brick through any moderate change of temperature creates a compression far in excess of the compressive value of the cement filler. Once this cement grout is compressed beyond its limitations, the bond between the brick fails, and the value of the brick slab is lost.

This can be illustrated by the foregoing test, where the expansion of grouted brick beam was .00000365 per degree Fah. Supposing the pavement should be laid at 40 degrees Fah. Later the temperature rises to 100 degrees Fah. This would give an expansion of .2628 inch to each 100 feet; in 500 feet this would be 1.314 inches. Surely an expansion to this extent would create a compression far in excess of the compressive value of cement and sand mortar.

Contraction.

Again, illustrating the point of expansion and contraction: Suppose the pavement be laid at 80 degrees Fah. and subjected to 20 degrees Fah. at a later period, or a 60 degree drop in temperature. This would create a contraction of .2628 inch in 100 feet, or 1.314 inches in 500 feet. Assuming a pavement 20 feet in width, 500 feet long, and 4 inches thick, and assuming again that the frictional resistance is equivalent to half the weight and half the length. This would give a friction of 133,280 pounds. Assuming the tensile strength of grouted brick of 150 pounds to square inch, and 960 square inches to this width of pavement, it would give a total tensile strength of 144,000, which is only a trifle in excess of the frictional resistance for this length of pavement.

Stress by Contraction.

It can be seen that any pavement greater than 500 feet in length would receive a stress greater than the tensile strength of the grout. Contraction cracks under these conditions are bound to appear. Whether these contraction cracks, causing the breaking down of the bond, are less serious than artificial expansion joints placed at intervals where the bond may be broken down on either side of such joint, is very doubtful. It appears to the writer that the elimination of the transverse expansion joints is a hasty conclusion, and will not be to the best interest of brick pavements under all conditions or types of construction.

Weak Places in Surface.

There are also to be found in grouted brick pavements weak places where the grout has not penetrated to the full depth of the brick, or even a small fraction thereof. These weak spots in the surfacing are always the first to give under contraction. These places are invariably irregular in shape and may occur at very undesirable locations. It is doubtful whether the expansion joint would correct such faults, but it would have a tendency to some extent to allow the brick surface to contract to its natural position without too great a resistance.

Cement Sand Cushion and Friction.

Where cement and sand is used as a sand cushion the cement will set up to a hard and rigid foundation. Friction from this type of cushion is no less than the weight of the surface upon it, and if there is any bonding tendency at all the friction would exceed several times the weight of the brick. It would not take a very long stretch of pavement under these conditions to exceed the tensile strength of the grout between the bricks. Expansion joints in such cases should extend through the surface of the brick, down through the base. This would give an opportunity for the base beneath to expand and contract with the surface superimposed upon it, otherwise it is much better under these conditions to eliminate the expansion joint, depending entirely upon the resistance of the pavement upon the base or the restraining power on either end of such pavement to take care of internal stresses of the pavement and prohibit movement upon the base.

Shifting of Surface to Uneven Bed.

Where the surface of the brick with a cement sand cushion is allowed to shift, the brick will move from the original recesses in the cement sand cushion created at the time of laying and may move to an uneven foundation. This condition is very undesirable, and any method that will eliminate it should be used in practice.

Monolithic Construction.

Returning to the monolithic type under general discussion, I think it has been proven that a resilient substance under brick is not a necessity. Combining the base and the surface to give the maximum strength to both is the addition of a very excellent quality to the pavement. This combining of base and surface has been tried with the use of both wet and dry mortar beds. By the preceding experiments it is shown that by the use of a wet mortar bed it is perfectly possible to obtain bond between the base and the brick. It is doubtful in my mind whether the dry bed will ever give as perfect bond as should be required in monolithic construction.

This lack of bond between a dry mortar bed and the brick may be explained by several reasonings. In the spreading of the dry cement and sand upon a wet concrete, it is often the case that the base has lost its moisture before the spreading of this thin mortar, or was not of the right consistency when laid to give free moisture on the surface. The spreading of a dry mortar or even pure cement has a general tendency to dry the concrete upon which it has been spread, and hasten the initial set without showing any plastic condition of this mortar surface. On the other hand, if wet mortar is used there is a strong tendency to add moisture to the concrete base and retard the initial set. In time it is probably this dry mortar bed will set to a degree of hardness, but will have very little bonding value to the brick surface. There is always a great difference in the degree of moisture in the concrete base, and also the sub-base beneath. This will allow moisture in some places to come to the surface of the dry mortar bed, while in others the cement in the mortar only sets up after a long period of time.

Wet Mortar On Stiff Concrete.

It seems to the writer that a wet mortar bed upon a comparatively stiff concrete would be much more desirable. This mortar bed should be thoroughly mixed until it reaches as plastic condition as possible in the time allowed. The size of the mixer should also be taken into consideration to give the desired consistency to the wet mortar bed. With a stiff concrete base and the mortar bed of such consistency to allow each brick to float to a perfect bed upon the surface of the base, I believe in this way the most perfect bond can be secured between the brick and the cushion, and also between the cushion and the base, and also by the use of a stiff concrete in the base, as suggested, and the brick can be laid with a 1 by 12 board on the surface without undue sinking of the brick with the weight of the brick layer or by the roller.

(Continued on page 294.)

Written for THE CLAY-WORKER.

SEEN IN NEW JERSEY.

THE HACKENSACK RIVER is open again, after being closed for about two months. A little ice remains at this writing, but it is possible for the yards on the Little Ferry side of the river to send boat loads of brick across the stream to the switch at Ridgefield Park, where the brick are loaded on cars. This will enable makers to get out the last burnings while the price is still high. Usually, the river is closed for more than three months, but this winter, while the cold has been continuous, it has not been severe enough to close the river for so long at a time. The demand for brick in New York will speedily absorb the supply left along the Hackensack when the yards closed last fall.

Prices at Hackensack are high, running up to about $10 at the yards, with the freight rate to be paid on top of that. While this varies, it is enough, with the cost of riding from the cars to the job, to raise the price close up to $12 on the work. Perhaps this is not prohibitive, but it tends toward restriction of operations and probably will prevent the development which might otherwise be expected. One time within the past ten years or so brick has sold at $15, but aside from that the price is now the highest known in more than a decade. Buyers are not so numerous at that figure, though inquiries seem to be fully as plentiful as they were before the high prices began to affect the market. Building operations will begin shortly and the supplies now held in the yards will be exhausted without much effort.

At the yard of the Homestead Brick Company, at Homestead, the last burning still remains untouched, ready for delivery. Through the winter months the price has been so high that buyers took only what they felt obliged to have to keep their business going. With spring, and the resumption of the usual activities it won't take long to clear out what is left here. The yards turned out the most brick they ever made in a year and sold them in each instance before the kilns were cool enough to handle.

Former Mayor H. Otto Wittpenn, of Jersey City, is one of the leading brick men of the state. His company supplies a great many of the brick used in the important building operations in Jersey City and during the past year or two the quantity consumed has been so large that he has been forced to buy the output of other yards in order to fill the requirements of his customers. Mr. Wittpenn has established a reputation for excellence of product, making it relatively easy for him to obtain the high prices now asked.

When the work of building the roads which are provided for in the new legislation are begun an effort is to be made to have brick selected for at least a portion of the way. Paving men have an opportunity to help develop a sentiment in favor of brick which will mean much to the New Jersey road builders and the New Jersey brick makers. Roads in this state are subjected to great wear because of the numerous automobiles which enter it from New York at the north and Philadelphia at the west. The combination is such that thus far no road material has been found which will stand the traffic. And yet they have never tried brick, the one material which would stand the wear and tear. If some brick highways can be included in the new roads friends of the material are confident that it will not only be included hereafter in the construction of all roads, but it will be a measure of economy for the state.

Brick in Newark has sold as high as $11 during the past month, and the tendency is to advance beyond even that figure. The early opening of navigation on the Raritan and Hackensack rivers will help relieve the situation to some extent, but for the present the situation is not very promising to brick buyers. The supply in Newark is insufficient to last long after the spring activities begin. Holders are firm in their views and refuse to make concessions on stock stored under cover. They insist that they will be able to get full prices for everything they have in hand. A. L. B.

WITH THE LIVE WIRES AT THE NATIONAL CONVENTION

NO CONVENTION would be complete without the machinery men. They are the most optimistic individuals one can meet and after a year such as last year they are in position to wear smiles that won't come off and to radiate optimism as a flower exhales perfume. And that is exactly what they did. The visitor to any one of their rooms was greeted so cordially that he almost bought a machine just to show that he was friendly and appreciated the efforts of the men to make him comfortable.

Their headquarters were scattered all about the floor of the hotel where the secretary had his headquarters and on other floors as well. Placards of all sizes and colors directed the searcher where to find the particular machinery firm he wanted. If, however, he succeeded in running the gauntlet of the others by the way he was fortunate. Not many did and the only way they could escape pausing and making a call was to hurry by when the occupants of the rooms whose doors always swung wide open were not looking, or else take advantage of a temporary absence.

These machinery men insisted that they did more business last year than ever before in their history. Moreover, they were saying to everybody that their establishments are operating to capacity now upon machinery for this season, but they are not adverse to accepting further orders. And they are getting them, too. One was making an estimate upon a complete outfit. Another was considering various machines. A third was detailing how much better new machinery would do the work in a certain plant than the old machines now in operation, and his listener was much interested.

That was why the machinery men were there. That they took away orders need not be said. That is understood. And, therefore, their convention visit was worth while to them, but far better for the plants which are to be modernly equipped in the future.

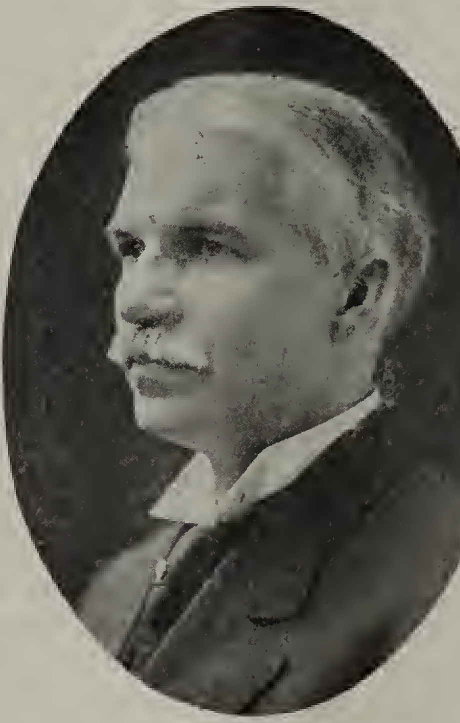
The American Clay Machinery Co. enjoyed the distinction as usual of having the largest delegation present. This delegation occupied twelve adjoining rooms on the twelfth floor. Some were from the main office at Bucyrus, Ohio, others from the office at Willoughby, Ohio, and others came from various outlying headquarters. Room 1273 was used for the reception of their visitors. Tables were covered with booklets, folders, catalogs and photograph albums. The walls were decorated with attractive posters boosting the American steam shovel, their Haigh continuous kiln, augur machines, etc., "Back to Brick" pennants and the American Safety First sign. A rose bush, full of blooms, added greatly in making the room most inviting to all callers. There was a large number of representatives on hand at all times, distributing their souvenirs, memoranda books, lead pencils and the button hole flag, which was one of the hits of the convention. Every delegate had been thoroughly aroused to a high pitch of patriotism by the recent events in Washington and the American flag afforded them an opportunity to modestly show their colors. The American Clay Machinery Co.'s representatives reported some attractive orders and some in prospect due to the convention and stated that it was indeed profitable for them. Evidently this is so, for the American Company has sent a large delegation to the convention for years past.

The International Clay Machinery Company, of Dayton, Ohio, had an attractive display in their reception room on the twelfth floor. They exhibited a model of their producer gas fired continuous kiln, a model of their Heavy Duty type of soft mud fire brick machine, a full sized special Heavy Duty drier car, a self-aligning flexible roller bearing for same, catalogs of their complete line, bulletins, blue prints of their producer gas fired kiln, producer gas fired metallic radiated drier and models of their gas producers. The company was represented by a quartette of live wires, M. Silverman, R. H. McElroy, George A. Anderson and H. L. Irwin. They reported a good business thus far this year with prospects for the best year in the history of this company. They are filling large orders and have quite a number on their books. The representatives kept open house all week, always greeted the visitors with the glad hand, explained the merits of their lines and handed out a most acceptable leather cased key ring as a souvenir.

Chambers Bros. Company, of Philadelphia, has several records hard to beat. Their line of machinery has a record for service rendered, as has also Mr. A. R. Root, one of their representatives, who holds the record with Secretary Randall in attending every one of the thirty-one annual conventions. He ably assisted Mr. Howard Chambers in looking after the interests of the Chambers Bros. Company. Mr. Root brought his family along with him, and all thoroughly enjoyed the festivities.

H. O. and F. F. Steele represented the J. C. Steele Company, of Statesville, N. C. From their happy countenances we were not surprised when asking about business conditions to be informed that their company was running full force and filling a large number of orders. This is one of the

F. B. Dunn, Conneaut, Ohio.



L. W. Penfield, Willoughby, Ohio.

J. H. Chambers, Philadelphia, Pa.

clay machinery companies which manufactures a complete line of machinery and have been in the business for such a length of time that they have established a splendid reputation for dependable products.

The L. E. Rodgers Engineering Company, Zanesville, O., was represented by that smiling, beguiling dryer man, L. E. Rodgers, who has built many a dryer the past few years, and has also had charge of building several complete brick plants.

J. C. Harris was button-holed by the delegates whenever he didn't get there first, and was busily engaged answering questions concerning the Underwood system of burning, the Justice radiated heat dryer and other products of the Manufacturers' Equipment Company, of Dayton, Ohio.

E. M. Freese & Co., Galion, Ohio, were represented by B. E. Place from the home office, R. A. Whiston, their New York man and E. W. Dow, of Pittsburgh. They make a general line of brick and tile machinery and they were quite certain that it possessed good points which every man in the business should know and they took especial pains to explain them. They gave out a leather letter carrier as a souvenir.

The Aspha Bric. Corporation had an interesting exhibit in room 1244. This consisted of samples of clay, shale and sand lime brick impregnated with asphalt and a high power microscope which showed the thorough impregnation of the asphalt. This exhibit was quite popular, there being some visitors in the room nearly all the time during convention week. The representatives were W. K. Kershaw, R. R. Barrett and L. W. Gay. Cigars were given out with the compliments of the company.

L. E. Rodgers, Zanesville, Ohio.

Harold Copping, Kankakee, Ill.

H. O. Steele, Statesville, N. C.

C. A. Potts & Co., of Indianapolis, was ably represented by Mr. George Potts, who received several nice orders for machinery and stayed over a few days after the convention ended to close up some pending business. He exhibited catalogs and photographs and presented the visitors with cigars. Much interest is shown in the new Potts special horizontal machine, which has been sold extensively during the past year to fire brick manufacturers. Sizes from the standard 9-inch brick up to fire clay blocks 30 inches long, 4½ inches thick and 11 inches wide can be made successfully on same.

The Thwing Instrument Company, of Philadelphia, had as its representatives C. B. Thwing, the senior member of the firm, and H. K. Walton, of New York. They cordially welcomed all visitors and saw to it that they understood something about their instruments before they left. They had on display their high resistance multiple recorder, high recorders with various thermo-couples and protection tubes demonstrating running actual records. This firm furnished nine complete plants during February.

H. Wirching was there for the Standard Dry Kiln Company, of Indianapolis, and his explanation of the working of the Standard drier was quite satisfactory to those who heard.

The C. K. Williams Company, of Easton, Pa., detailed Mr. Geo. W. Witman to boost the Anchor Brand colors sold by the company, and from appearances the firm's interests were well taken care of.

Mr. Frank McClellan, one of the old timers in the clay machinery game, represented the Arnold-Creagor Company, of New London, Ohio. He had on display in the machinery hall and in his room attractive literature on their S. S. S. special automatic brick machine.

The J. D. Fate Company, of Plymouth, Ohio, was represented by J. A. Ridgeway, their eastern representative. Illness and unpreventable circumstances was the cause of the company not having a larger delegation at the convention. Mr. Ridgeway reported that the J. D. Fate Company was experiencing an unusual demand for their gasoline locomotive, and that their business in general was exceptional.

The Hook Patent Kiln Company, of Columbus, Ohio, had two live wires in H. P. Jenks and H. L. Longnecker. They were on the job from start to finish and booked some nice orders for the installation of their kiln. In room 1212 they exhibited blue prints of their kilns and driers, and had an immense number of kodak views under a glass on a round table, showing kilns already installed. Letters of endorsement by many of the users of the Hook patent kiln were on display.

The Roessler-Hasslacher Chemical Company, of New York, a rapidly growing concern, was represented by O. W. Will, H. Schmidt, H. W. Smith, Warner Malsch and W. L. Brewer. They told of the growth of the business and explained wherein the product of the concern's plant could be made useful to brick men. They gave as souvenirs a miniature whisky flask in imitation of a tinfoil covered cigar and a little suggestion on economy.

Mining clay by means of automatic shovels has been made a thing of ordinary daily activity, and among the shovels used for this purpose the Thew automatic shovel made by the Thew Automatic Shovel Co., of Lorain, Ohio, ranks very high. H. A. McLaughlin, R. M. Gates and L. E. Darling were the representatives who saw to it that many were made acquainted with its merits. They had an exhibit in the Grand Central Palace during the building show.

C. R. Peregrine, of the Macbeth Evans Glass Company, Pittsburgh, took occasion to renew many acquaintances in the membership. Business with his house is good, he said.

Grafton E. Luce was the man who explained the Lambert process, of Chicago. Those who had no information on the subject were placed in possession of facts which interested them greatly.

C. S. Linder, of the Pittsburgh Plate Glass Company, Creighton, Pa., was present to extol the merits of his firm's product and explain why it should be selected in preference to any other make.

R. L. Frink, of the Frink Pyrometer Company, Lancaster, Ohio, made himself acquainted with those he did not know and renewed acquaintance with old friends. He reported business as better than ever before.

R. C. Bennett, of the Wellington Machine Company, Wellington, Ohio, told his friends that last year was a fair year and that this year is exceeding it in volume of sales. He was following up several inquiries while at the convention.

J. E. Hall, of the Adams Bros. Payne Co., of Lynchburg, Va., was one of the busy delegates at the N. B. M. A. convention. He buttonholed the face brick manufacturers for the purpose of obtaining a line of light cream rough texture brick.

The Chase Foundry and Manufacturing Company, of Columbus, Ohio, was as usual represented capably by A. J. Dunn, who gave the glad hand to a host of friends and made the acquaintance of quite a few new members. He explained the many merits of their cars and equipment and no doubt received his full share of orders for his well-known company.

The American Manganese Steel Company, Pittsburgh, was represented by Arthur Whitcraft, who was not looking for orders so much as he was to see his friends and wish them well for the year. Another representative was Ray Clark, Jr., who is well known to most brick men.

The necessity of explosives in clay mining arises sometimes and to represent that portion of the business J. B. Stoneking, representing the E. I. DuPont de Nemours Company, of Wilmington, Del., was present and assured the brick men that his firm is in the market for anything in their line that may be wanted.

"Charlie" Stevenson, of the Stevenson Company, Wellsville, Ohio, was a real glad-hand artist, entertaining his listeners with his usual long line of clever stories intermingled with facts concerning the Stevenson line. He had on exhibition one of the first sewer pipes ever manufactured in this country. This was made nearly seventy years ago and was evidently made by hand. It was funnel shaped, so that the smaller end could fit into the larger end of the next pipe. The pipe was in perfect condition. We hope to give further details concerning this in a later issue.

R. O. Keiser and Harold Copping, together with E. B. Ayres represented the Philadelphia Textile Machinery Company. They exhibited photographs of drier installations, etc., and handed each delegate a complimentary cigar. This firm sells a drier which has become quite popular among the clayworkers of the country. The firm has just moved into a new quarter of a million plant which is fitted with every modern convenience for doing business and is now equipped to fill any number of orders. It has made a number of important installations recently and has others equally as good in view. Asked for a statement one of their representatives said, "Our business during the past year has been most satisfactory. Proctor driers have been installed in several of the most representative plants in the country. As clayworkers learn more about the principle and operation of this drier they readily see that it is correct and ideal for drying clay products, particularly hollowware and products made from tender or troublesome clays. Indications all point to a good business during 1917."

The interests of the Charles Englehard Company, of New York, were handled by R. W. Newcomb and A. L. Terry, who expressed themselves as well pleased with the convention and the business made for their company. They sell Heraeus La Chatelaer pyrometers.

Up in Walkill, N. Y., is the G. B. Mentz Company. George B. Mentz, the head of the firm, came down to the convention and had an optimistic word for all he met. His firm did a good business during 1916, and is destined to do a still better one in 1917 he thinks.

The Frost Manufacturing Company, of Galesburg, Ill., was represented by W. A. Day and W. E. Ruggles, who reported a good demand for their splendid dry pans, boilers, etc.

The Lakewood Engineering Company, of Cleveland, had in charge of their interests, Mr. W. A. Meddick, who stated that business conditions were splendid for the Lakewood Company.

The Dunn Wire Cut Lug Brick Company, Conneaut, Ohio, had a good delegation looking after their interests. Among those present were W. T. Blackburn, R. T. Smith, Wm. C. Perkins and F. B. Dunn. This company has made wonderful progress in creating a great demand for Dunn wire cut lug brick. May their shadow never grow less.

The Bonnot Company, Canton, Ohio, one of the best-known clay machinery firms in the business, was well represented by A. A. Oldham and David W. Jasper. They buttonholed the delegates, booked some orders and handed out attractive steel tape measures. This company is experiencing its full share of good orders and is well pleased with the prospects for the coming year.

We, like many of the other N. B. M. A. enthusiasts, were delighted to shake hands with G. S. Brubaker, representing the H. Brewer Company, of Tecumseh, Mich. He is one of the old timers who is well known, well liked and makes friends wherever he goes. He states that business is good and that 1917 will be a good year for the H. Brewer Company. M. L. Kreider also represented this company and was an able second to Mr. Brubaker. Catalogs and prints were on display and excellent cigars were given with the compliments of the company.

OREGON CLAYWORKERS HOLD CONVENTION.

The third annual meeting of the Oregon Clayworkers Association was held at Eugene, March 15 and 16, 1917. A very good program had been arranged by the president, H. S. Smith, and Samuel Geijsbeek, both of Portland, covering the various phases of the business. Eugene is the home of the Oregon State University and the faculty co-operated with the officers of the association in making the meeting a successful one. A report of the convention will be given next month.

PROMINENT CLAYWORKER RETURNS TO UNITED STATES AFTER FOUR YEARS RESIDENCE IN CANADA.

A. F. Greaves-Walker, for the last four years assistant general manager of the Sun Brick Company, of Toronto, Ontario, Canada, has severed his connection with that company to become associated with the American Refractories Company, with headquarters at Baltimore, Md., where the company is building an immense new plant. Mr. Greaves-Walker will have charge of the construction of this fire brick plant. Mr. Greaves-Walker was elected president of the Canadian Clay Products Association at its last convention, and the members of the association who had been so pleasantly associated with him, tendered him a dinner and theater party on the eve of his departure from Toronto, at which time they presented him with a very handsome cigarette case, and insisted that he retain the presidency of the Canadian Association until the end of his term.

MILLION DOLLAR LOSS.

The Steiger Terra Cotta & Pottery Works, San Francisco, California, was almost totally destroyed by fire March 8. The loss is estimated at approximately $1,000,000.

ATTRACTIVE EXHIBIT OF BROWN INSTRUMENT CO.

If the visitor did not learn the many merits of Brown pyrometers it was his own fault, for John P. Goheen, George Keller and J. W. Anderson, representatives of the Brown Instrument Company, Philadelphia, were always on hand at their headquarters in the Hotel McAlpin, where they had a display set up to give every brick manufacturer a complete idea of how a pyrometer equipment operates in his plant and the advantage it would be to him. On a small table, as shown in the illustration, an electric furnace was attached to the wall socket, and by means of the resistance shown at the side of this furnace it could be heated up to any desired temperature. It was usually run at about 2200 degrees, but could easily be reduced to 1200 or 1800 degrees by the rheostat. This furnace represents a typical kiln. in the front, shown by the white porcelain tube, was attached a platinum rhodium thermo-couple and this was connected direct to the indicating Brown pyrometer at the left of the furnace above the eight-point switch. From the indicating pyrometer, wires led to the recording pyrometer with circular chart also at left. To the right of the furnace the continuous Brown recorder is shown, and on the panelboard in front of window the recording thermometer for dryers. The bulb of this thermometer is laid on top of the furnace, and carries constantly the lower temperature varying with the heat of the furnace. When the furnace is heated to say 2200 degrees there is an accurate reading of 2200 degrees on the indicator and both recorders make similar records on either the circular chart at the left or the continuous chart at the right. The brick men attending this convention had before them a complete idea of what a pyrometer shows them. The indicator is the instrument installed in the burner's house many feet away, and gives the temperature of any of the kilns. The recorder makes a test record in the superintendent's office as far as a mile away, on just what is doing throughout any one burn. The continuous recording type of pyrometer is, of course, optional. A brick man gets a clear comparison of both the base metal and platinum rhodium thermo-couples and their respective features by the couples shown on the table. At the extreme left are shown the monthly circulars which this company distributes, and on the walls are dozens of photographs showing pyrometer installation in many of the largest and best known brick plants in the country. The gentleman in the photograph is Mr. Goheen, sales manager of this company, talking to a prospective customer. The Brown Instrument Company is willing to give complete information about their pyrometers to any one who will just drop them a line asking for catalog N. 10.

Headquarters of The Brown Instrument Company. Hotel McAlpin, Convention Week

EFFICIENCY EXPERT FOR THE CLAY FIELD.

We are in receipt of an announcement from Dwight Thompson Farnham, the well known efficiency expert, to the effect that he has opened offices for the practice of consulting engineering, specializing in industrial work, scientific administration, sales, and factory management, centralized control, waste elimination and efficiency methods as well as financial investigations. While he will have offices both at 50 Church street, New York City, and Third National Bank Building, St. Louis, Mo., the latter will be the main headquarters. Mr. Farnham is a man of much ability in his chosen line and we predict for him a busy and prosperous career.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

BESIDES THE PROBLEM of the high cost of living there is a problem of nearly as much interest to the man of construction material and labor. It is the high cost of building. For, as a man must eat, so must he have shelter. When he is unable to procure a certain kind of food he adjusts himself to the laws of life by seeking nourishment from some other pabulum. When a material of which a man is in the habit of building goes beyond his grasp in quantity, and, consequently in price, he must find some other material that will serve him the same purpose.

A specific instance of the last named exigency lies in the situation of building materials today. The enormous demand of Europe's cannon on the steel of the entire world and the abnormal scarcity of labor necessary in the production of concrete, are putting those two collateral building materials beyond the purchase price of the average Walter Smith who wishes to erect a modest grocery in any Sleepy Hollow in the country. Of course, it is like speaking in parables, but it best expresses a situation. On that situation are based the bright prospects and hopes of the brick and mill-work interests of every state, and, incidentally, of Wisconsin.

Throughout the entire brick territory of the Badger State, enlargements of factory accommodations in general are the plans of every owner. Already there are in the hands of Wisconsin contractors more specifications for structures of brick and mill-work than ever before in the history of American building. General stores, movie houses, apartment buildings, schools, churches, halls, residences, garages, barns, and everything else to be occupied by man, beast or machine will require a material which can supplant that substantial product, reinforced concrete, now gone beyond the limit of affordability in price. The only natural answer in the solution of the problem is "Brick." And brick shall serve the purpose in Wisconsin. With the greatly increased use of brick the various tiles and clay products will establish themselves concomitantly with all materials of kiln production.

Realizing the conditions attendant upon construction and the consequent opportunities they afford to the brick and clay element, the Wisconsin Clay Manufacturers' Association, in session recently in Milwaukee, passed resolutions urging that all possible means be taken to advertise brick and tile for building and drainage purposes. Newspaper advertising, essay contests for public school children, and other mediums for announcing to the public a more economical ware are now promoting the interests of the Wisconsin brick industry. United action is the policy. Every interest is increasing its own capacity of production to supply a demand already big and bound to grow bigger through organized effort.

The Burlington Brick & Tile Company, Burlington Wis., recently made its first shipment of tile by freight over the interurban line between Burlington and Wind Lake, Wis., when it consigned an entire carload of its product for spring construction work at Wind Lake.

J. D. Pratt, of Menomonie, Wis., has been appointed general manager of the Wisconsin Red Press Brick Company's yard at Menomonie, Wis. He still retains his capacity as foreman.

Milwaukee building activities for February, 1917, fall behind those of last year. This year eighty-two permits, aggregating $783,844, were issued as compared with 174 permits, involving $823,178, in February, 1916.

Four architects have submitted plans to the committee on the contemplated seventeen-story building for the Wisconsin National Bank.

A. BADGER.

New York, with its Hudson River region, has been leading the country in the production of common brick with a high record of practically a billion in one year, but Cook County, Ill., has been coming forward, too, and threatens to make New York hustle to maintain its lead.

FRANK H. RIDDLE JOINS FORCE OF U. S. BUREAU OF STANDARDS.

THE U. S. Bureau of Standards, Pittsburgh, Pa., is indeed fortunate in securing the services of Mr. Frank H. Riddle, a man of unusual ability in research work, because of his years of study and wide experience in various parts of the country. The U. S. Bureau of Standards now has a group of technical men unequalled in any similar department in the world.

Mr. Riddle came from the West, where in his boyhood days he had spent many hours around the Van Briggle Pottery at Colorado Springs, Col. He entered the Ohio State University at Columbus, taking the full ceramic course, and, aided by his previous knowledge, became one of the leading students of his class. So well did he do his work that at the end of his college career he was offered a position by the head of the ceramic school as an instructor in the department. He filled this position very satisfactorily for two years when he accepted a more lucrative position as superintendent of the Van Briggle Pottery. He later became manager. His work included entire charge of the mechanical and manufacturing layout of their new plant and the putting of same into correct operation. His next advance was in 1910, when he came ceramic chemist for the American Sewer Pipe Company, of Akron, Ohio. He improved the work and methods of operation there in the manufacture of both sewer pipe and paving brick. In 1912 he became superintendent of construction and works manager of the Kilgard Fire Brick Company, Ltd., British Columbia. He had charge of the erection of the factory for making sewer pipe, face brick and fire brick, including the opening of the mines and building employes homes, stores, school, etc.

Frank H. Riddle, Pittsburg, Pa.

He was employed in efficiency engineering work at several plants on the Pacific Coast, including Gladding, McBean & Co. and the California Pottery Company, of San Francisco, and the Pacific Sewer Pipe Company, of Los Angeles. This work included a study of methods and costs in the manufacture of all kinds of heavy clay products, sewer pipe, face brick, fire brick, terra cotta, enameled brick, stoneware and kindred products, as well as a study of several methods of handling fuel oil and coal.

His position with the U. S. Bureau of Standards is in the capacity of associate ceramic chemist. He will have charge of the ceramic laboratories under Mr. A. V. Bleininger, ceramic chemist. With Mr. Riddle's experience covering a wide field of products in a good many parts of the country and with a good many kinds of clays, including operation and cost, this combination will no doubt be of particular value to the bureau. We congratulate the bureau on this splendid acquisition and feel sure that Mr. Riddle will render a great service and at the same time enjoy his work shoulder to shoulder with such a fine technologist as A. V. Bleininger.

DOESN'T BELIEVE THIRTEEN UNLUCKY.

One of the happiest of the happy delegates to the recent National Convention was R. G. Eisenhart, Horseheads, N. Y. He insists that he is always happy when he can make enough money in the brick business to meet the expenses of a trip to the convention. He was accompanied by his wife, two daughters, a granddaughter and a grandson; and the latter displayed with much pride a picture of the family group, which we reproduce, and by which the reader will see that Eisenhart, junior, the son, in the center of the group, has thirteen children, eight boys and five girls, a record of which Grandpa Eisenhart is exceedingly proud. If any reader of The Clay-Worker can make an equal showing with Mr. Eisenhart, we will be glad to have them submit documentary evidence in the form of a similar view. The grandson, J. Richard Eisenhart, who is shown at the right in the upper tier, who was the one in attendance at the convention, says he is going to follow in the footsteps of his grandfather and become a brickmaker.

Fifteen Eisenharts Who Have Gladdened the Heart of Grandpa R. G. Eisenheart, Horseheads, N. Y.

LOUISVILLE CLAY FOLKS ORGANIZE.

The brick interest in Louisville, including both manufacturers and dealers, have as a result of a couple of meetings gotten together and formally organized the Louisville Brick Manufacturers and Dealers Association, to boost brick and to promote a better order of fellowship among the members of the trade. The officers of the new organization are: T. Bishop, of the Southern Brick and Tile Company, president; H. H. Frazer, of the R. B. Tyler Company, vice-president; Isaac Tyler, of the Tyler Builders' Supply Company, secretary; K. S. Markendorf, of the Union Lime and Cement Company, treasurer.

Two active committees have already been doing some good work. One is the committee on ethics, of which H. H. Frazer is chairman, and the other is the committee on publicity, of which Jas. T. Howington, of the Coral Ridge Clay Products Company, is chairman. Mr. Howington is going about the work of publicity in real earnest and they have already indulged in a round of ads in the daily papers, have ordered 500 Build With Brick signs to the tacked up along the roads leading out of Louisville and are planning a series of circulars.

The present membership consists of seven Louisville firms, as follows: Southern Brick and Tile Company, P. Bannon Pipe Company, Hillenbrand Brick Company, Coral Ridge Clay Products Company, Tyler Builders' Supply Company, Union Cement and Lime Company and R. B. Tyler Company.

CONVENTION NUMBER—AN EXTRA EDITION OF THE CLAY-WORKER.

As OUR READERS may judge from the summary of the convention on preceding pages, the Thirty-first National Convention of the N. B. M. A. was a decided success. The attendance was all that could really be expected under existing industrial conditions. If all the members of the American Ceramic Society had registered as they usually do, the roster would have passed the seven hundred mark, a splendid showing under the circumstances. The coal and car shortage and threatened labor troubles in various sections kept many of the members at home, who, under normal conditions, would have attended the meeting. A large attendance, however, is not the most essential element of success in such gatherings. The attendance at the sessions and participations in the discussions of the various subjects under spects the convention was an improvement over those of recent years. The technical papers were exceptionally able and instructive. These, and all the discussions, will be given in full in a SPECIAL number of The Clay-Worker to be issued a couple of weeks later. It will make a valuable addition to the literature of the trade, that will be preserved as a book of reference by many of the craft, and on that account will prove an exceptionally valuable advertising medium. A word to the wise is sufficient. Advertisers desiring to take advantage of the opportunity for effective publicity are requested to supply copy forthwith. As in former years, the discussions will be given verbatim, and the pages will be embellished with portraits of the officers and active participants. The issue will be mailed to all regular subscribers. Others desiring the convention number are requested to write for same. Next to attending the convention, the full verbatim report of The Clay-Worker is the best and only means of acquiring the fund of trade lore provided by this report. To students of claywork and those desiring the latest word in improved processes, this convention number alone will be worth several times the yearly subscription price. Don't miss it.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVII. MARCH, 1917. No. 3.

CURENT COMMENT.

Are you putting up some Build With Brick signs?

* * *

Are you co-operating with your competitor—or fighting him?

* * *

There is every promise of a busy summer in both building brick and paving brick. Are you prepared for it?

* * *

Those who didn't go to New York can read about the doings there in The Clay-Worker, and that will help some.

* * *

With help scarce all around, a little higher cost should not interfere with the progress of labor-saving machinery or devices.

* * *

The drain tile business, while making fair progress, has not lately, unless it was last year, attained the high point of the peak periods of 1909 and 1910. It ought to pass that period now soon.

* * *

Back in 1905 the average price of common brick was $6.25; in 1915 it was $6.15. Question: What will we make it in 1917? Surely, it is time to get out of the low price rut and get a fair value for this product.

* * *

That government farm loan idea will soon be in working shape and all you brick men should be getting busy with plans to interest the farmers in the subject of how they can benefit by borrowing money to make farm improvements and build good brick homes.

* * *

One of the puzzling features of the clayworking industries is the decline showed in the quantity of sewer pipe produced the past few years. Logically, the quantity of sewer pipe required today should be considerably larger than in 1913, yet 1913 was the banner year in this product. The only explanation in sight is that the losses were in the larger sizes, which have been in sharp competition with concrete.

* * *

"America First" does not mean every man for himself, but all of us co-operating together for the general good.

* * *

Again we rise to remark there is need for specific concerted action with a view to boosting the use of burned clay roofing tile.

* * *

The value of the pottery product of the country has nearly doubled in the past fifteen years. Somehow we feel like we ought to be able to say the same thing of the brickmaking industry, but we **cannot.**

* * *

What few war clouds are hanging over this country do not seem to disturb business any, which speaks mighty well for both the common sense and the confidence of the people in the integrity of the nation.

* * *

What the brick trade needs more than anything else this year is the salesmanship and the backbone to get a fair price for its product. Brick has been dragging along at too low a price for too many years, and the trade should get out of this rut during the present year.

* * *

One good idea that has been mentioned heretofore, but is worth repeating, is that the brick man should study and cultivate his home territory diligently as a first consideration, because the nearer home you can sell your product the less will have to be paid out in freight and the better are the chances to relieve price cutting competition.

* * *

The furniture people are actively at work on a proposition to spend a million dollars in a campaign to boost furniture around the central idea of the Better Homes movement. The first logical step in the Better Home movement is to build the homes of brick, and if the furniture people are willing to conduct a million-dollar campaign to boost furniture for the home, how much should the brick people spend exploiting the best building material with which to construct the home?

RAIL AND WATER TRANSPORTATION.

We are in receipt of a copy of the official proceedings of Central States Conference on Rail and Water Transportation, held under the auspices of the Evansville Chamber of Commerce, at Evansville, last December, in which many memorable addresses were made which are now preserved in form for distribution in this printed report. They constitute good reading and furnish considerable light on the subject of inland water transportation in the central states, especially up and down the Ohio and Mississippi rivers.

GEORGIA KAOLINS.

One of the interesting pamphlets coming to hand is Bulletin 128 of the Department of Interior, Bureau of Mines, on refining and utilizing of Georgia Kaolins, by Ira E. Sprout.

In the introduction of this publication, the question of why cannot American kaolins be substituted for English china clay is repeated as one which has been asked frequently. Then it is pointed out that the investigation described in this report was carried on to determine the practicability of applying technical control of clay disperse systems to the refining of kaolins and the utilization of the prepared clay in the manufacture of vireous china and wall tile.

The hope is expressed that the report will prove a stimulus to the claywashing industry; will point out a method of refining certain American clays, and will lead to a larger utilization of domestic kaolins in lieu of importing china clays.

The pamphlet carries many nice illustrations and graphic diagrams of Georgia deposits, which have so far been surveyed and developed or investigated and should prove a valuable aid to all interested in the subject of domestic kaolins.

HELPING THE REFRACTORY INDUSTRY.

The U. S. Bureau of Standards has been very active in its co-operation and assistance to the clayworking industries, especially since war has interfered with certain importations from Europe have they devoted themselves to the work of developing the same industries here.

One example is the making of spinel (magnesium aluminate) refractories, which has been under way for some time. This work, it is said, has progressed to the point where it is possible to forsee a valuable addition to the list of American industries.

It is also announced that the clay section of the Bureau expects to soon be ready to assist manufacturers in the production of refractories of this class which heretofore have been made in Germany, but are a new product for the United States. Also it is continuing its study of refractory porcelains.

THE PRODUCER GAS PLANT.

The subject of producer gas has been one of considerable interest to the brickmaking fraternity for a number of years, and since it has become a factor in brick burning there should be special interest to brick manufacturers in the investigations leading to the possibilities of producer gas for power purposes. In fact, this should make an interesting line of engineering study and perhaps leading to a wider use of producer gas power units in connection with clay working industries. Some light on the progress of producer gas power units is furnished by R. H. Fernald, of the Bureau of Mines, in Bulletin 109 on operating details of gas producers. Mr. Fernald has gotten together some interesting data, showing the progress so far made and the difficulties, mainly of lack of interest, which it is necessary to overcome. The subject of producer gas power possibilities is commended for study, especially by those brick manufacturers who have turned to producer gas in burning clay, because the two should naturally go together.

THE BIG FOUR IN CLAY PRODUCTS.

There are four states which produced in 1915 more than ten million dollars worth of clay products, each constituting what might be termed the big four in the clayworking industry. They are in the order named, Ohio, Pennsylvania, New Jersey and Illinois.

The list of the big four is led by Ohio, with a total of nearly thirty-seven million dollars worth of clay products, followed by Pennsylvania with twenty-two and three quarters million, New Jersey with practically sixteen million and Illinois, fourteen and three-quarters million. New York came very near getting into the eight figure class, with a total of approximately nine and one-half million, and Indiana went about seven million and Iowa and West Virginia both went above the six million mark, with Missouri at five and one-half, California three and one-half and three other states running above the two million mark, including Kansas, Kentucky and Michigan, while a dozen other states went above the million mark. The four mentioned above, however, stand out conspicuously with totals ranging from fifteen to nearly thirty-seven million dollars each.

In the case of Illinois, the dominant item was brick and tile, with pottery constituting only the major fraction of a million dollars. In New Jersey, on the other hand, the pottery item was the dominant item, amounting to more than the total of brick and tile. Ohio showed up big in both brick and tile and pottery, running practically twenty-one million in brick and tile and nearly sixteen million in pottery, while Pennsylvania ran nearly twenty-one million to brick and tile and less than two million in pottery.

There are two states in the Union in which the pottery products exceeds the brick products. These are New Jersey and West Virginia. Some other states show important pottery products, but the total is elsewhere considerably less than the total brick and tile.

CANADIAN FELDSPAR.

In response to inquiries from American firms about feldsspar in Canada, Consul Felix S. S. Johnson, of Kingston, says that prior to the European war the feldspar from that consular district was only employed in the manufacture of pottery, but since the non-importation of potash from Europe the Canadian feldspar has been substituted by American soap manufacturers and fertilizer makers.

He reports that the analysis of feldspar found in that district are as follows:

Silica	65.40 per cent.
Alumina	18.40 per cent.
Potash	13.90 per cent.
Soda	1.95 per cent.

He reports that the best time for the exportation of this material is during the navigation season, from April 1 to November, when special rates can be had by boat from Kingston to points in northern New York. One of the mining properties in the district, he says, has a grinding plant near Rochester, N. Y., and the product of this is sold to potteries at Trenton, N. J., and East Liverpool, Ohio.

MAKING A CAT'S PAW OF BRICK.

People who make a feature of the mail order business in lumber and millwork for houses have incidentally, in connection with the illustrations accompanying their advertisements, been making a sort of cat's paw of brick.

The scheme is to show a picture of a house with a brick chimney, brick piers and sometimes entire brick walls for the porch and brick, stone or concrete foundations, then accompanying a picture of this kind the catch line in the ad tells that the material for this house can be purchased for such and such a sum, usually a sum considerably below what it originally cost to buy material for such a house.

To save themselves, however, there is generally found in the small type matter set underneath a stipulation that the price includes all materials cut to fit as follows: Lumber, millwork, flooring, outside and inside finish, doors, windows, shingles, lath and plaster, hardware, locks, nails, paints and varnishes. So, in the final terms, there is no agreement to ship the brick for the chimney and piers or to supply the foundation in any form.

The whole game is to sell lumber by mail in competition with established retail dealers in each community, and this we might regard as being the lumbermen's fight and not concerning the brick men at all. However, it does concern the brick man for two reasons. One is because the brick work is shown in the picture and acts as a cat's paw to help pull orders from the unwary. The other reason is that it is a species of cheap or flimsy building which is not only antagonistic to the progress of brick in building operations, but in the end is unsatisfactory to the builder.

The boosting of brick involves a campaign of education against catch penny schemes of every nature which promote cheap, flimsy construction, and for this reason the effort of the brick manufacturer should be fundamentally opposed to propaganda of this kind. That is where it affects the brick trade the most. It is encouraging of the cheapest kind of construction, using brick as a cat's paw to help the game along. It should be a splendid idea for the brick men in each community to take these advertisements which appear in many of the leading family papers and magazines, showing bungalows and houses of various sizes with brick work in them which is not included in the offer, and tell a little story about them in their local paper. Also tell something of the difference betwen flimsy houses and well built houses. When the public once comes to thoroughly understand the deception practiced here, it will be in a mood to accept some of the good doctrine of brick for home building, and in this way benefit itself with better houses as well as contribute to the welfare of the brick business.

ARBUCKLE COMPANY INCREASES SALES.

There is a concern in Rushville, Ind. (Arbuckle and Co.), manufacturing clay machinery, which is experiencing satisfactory increased sales in their various lines. In particular demand at this time is their pug mill or granulator, a high grade product which is built with any length tub from 9 to 18 feet. See their advertisement on page 321 of this isue.

COOK COUNTY TO THE FRONT.

One of the outstanding features mentioned in the U. S. Geological Survey report o nthe clayworking industries for 1915 is the coming to the front of Cook County, Illinois. This county produced in 1915, 739,173,000 brick, which was only 2,395,000 less than the New York portion of the Hudson River region output, and it exceeded the New York Hudson River region output in value by a round million dollars, thus for the first time on record putting it in close competition with the famous Hudson River region.

Moreover, the same report shows that Illinois was the largest producer of common brick in 1915 as for several years, and 69 per cent of the total Illinois output, which made it the greatest producing state in common brick, was from Cook County.

This puts Chicago on the map as coming to the front rank in the common brick industry, and for that matter the whole state of Illinois made a splendid showing by leading the procession in common brick making, and one of the interesting features is the way Cook County is making the Hudson River district look to its laurels as a leader in the production of this great staple.

AWAKENING OF BUSINESS.

Many of those who followed interestedly the activities of Edward N. Hurley, while vice-chairman and then chairman of the Federal Trade Commission, will be glad to know that he has put a number of his thoughts and ideas into book form under the suggestive title of "Awakening of Business." This book is published by Doubleday, Page & Co., Garden City, N. Y., for the Associated Advertising Clubs of the World, price $2.

In the author's preface he says that it is hoped the book may assist business men in bettering business conditions and in working out sound methods of co-operation, that it will inform them of government activities in their behalf and bring about a closer harmony between them and the government.

In Chapter five Mr. Hurley pays a compliment to trade association efforts in the following paragraph:

"Co-operation is the watchword of our day—co-operation among business men, co-operation between employer and employe, co-operation between business and government. We have seen that there is a field for individual effort on the part of manufacturers and merchants; there is an almost equally large field for associated effort. Trade associations and similar organizations are among the most hopeful agencies of efficient industry. Their field of activity should be extended and their work made more efficient."

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VITRIFIED PAVING BRICK.

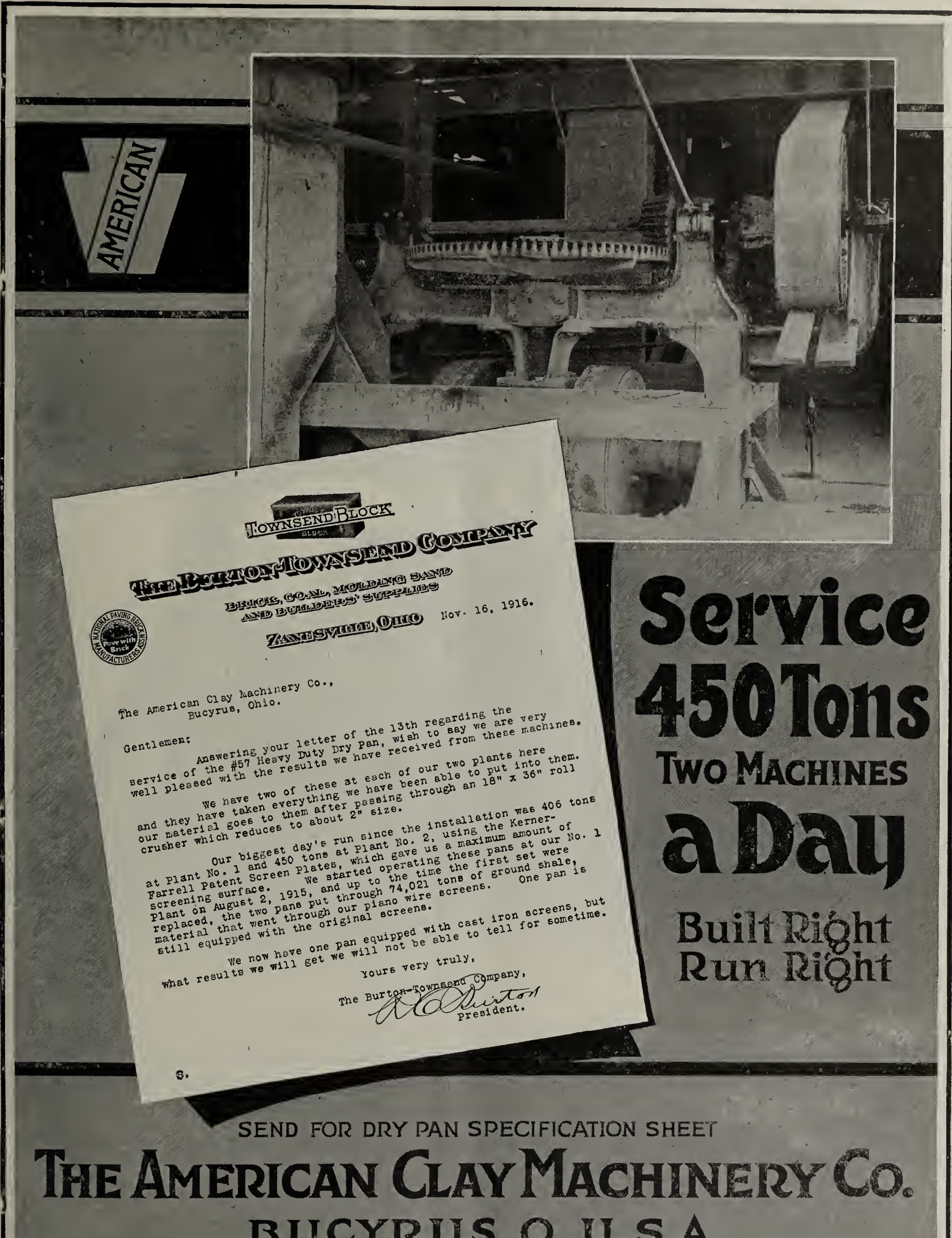
A valuable treatise on the manufacture and use of Paving Brick up to date. By H. A. Wheeler, E. M. Second Edition. Mailed to any address on receipt of $2.00.

T. A. RANDALL & CO., Publishers, Indianapolis.

And again in the concluding chapter he points out that business people must not only put their houses in order, but must get together, that no business can go far toward true success if suspicion and fear are the impulses which govern its members. Trade associations, he says, are the machinery of co-operation, through them ignorant competition can be destroyed to a large extent and the basis upon which business is conducted can generally be made more intelligent. In fact, he says trade associations are, and in a way in which we do not appreciate in this country, a means of salvation for American business.

There is embodied in the book much sentiment and assertion that was put forth by Mr. Hurley during his service on the Federal Trade Commission, and it will certainly make a valuable addition to any business man's library.

G. S. Randall, P. E. Bryce and W. W. Bond have taken a lease on several hundred acres of land near Kings City, Cal., and will erect a modern plant there that will have a capacity for making 30,000 brick a day. They plan to offer the manufactured product in the open market by May 1st, and have already received the machinery for their plant. They succeed W. W. Bond and Mr. Avery, who first promoted this project.



TOWNSEND BLOCK
THE BURTON-TOWNSEND COMPANY
BRICK, COAL, MOLDING SAND
AND BUILDERS' SUPPLIES
ZANESVILLE, OHIO

NATIONAL PAVING BRICK MANUFACTURERS ASSN. Pave with Brick

Nov. 16, 1916.

The American Clay Machinery Co.,
Bucyrus, Ohio.

Gentlemen:

Answering your letter of the 13th regarding the service of the #57 Heavy Duty Dry Pan, wish to say we are very well pleased with the results we have received from these machines.

We have two of these at each of our two plants here and they have taken everything we have been able to put into them. our material goes to them after passing through an 18" x 36" roll crusher which reduces to about 2" size.

Our biggest day's run since the installation was 406 tons at Plant No. 1 and 450 tons at Plant No. 2, using the Kerner-Farrell Patent Screen Plates, which gave us a maximum amount of screening surface. We started operating these pans at our No. 1 Plant on August 2, 1915, and up to the time the first set were replaced, the two pans put through 74,021 tons of ground shale, material that went through our piano wire screens. One pan is still equipped with the original screens.

We now have one pan equipped with cast iron screens, but what results we will get we will not be able to tell for sometime.

Yours very truly,

The Burton-Townsend Company,
W. C. Burton
President.

S.

SEND FOR DRY PAN SPECIFICATION SHEET

THE AMERICAN CLAY MACHINERY CO.

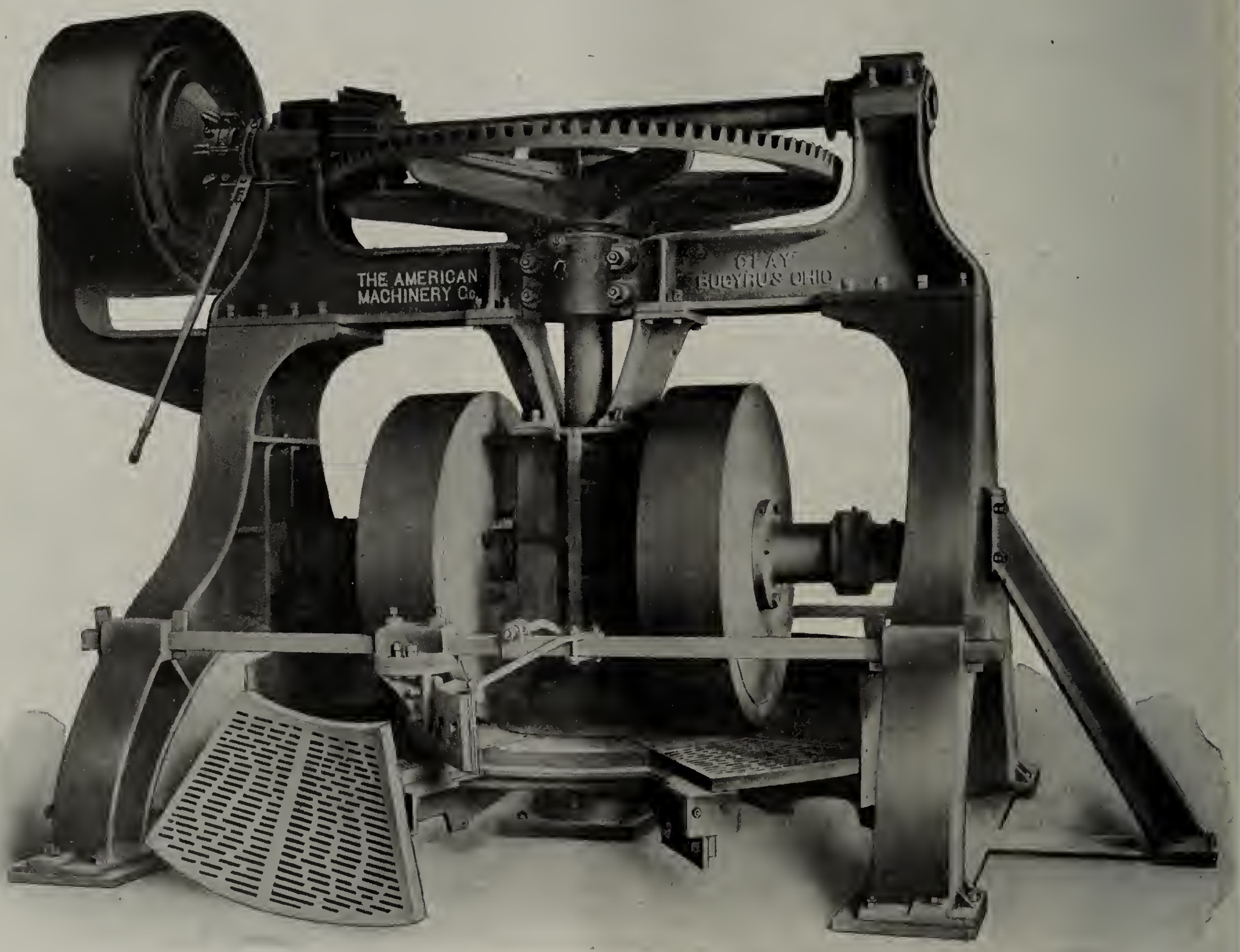
BUCYRUS, O., U. S. A.

A PAN WITH A RECORD

On the preceding page we print the statement of one of Ohio's leading paving brick manufacturers.

HERE ARE THE HIGH SPOTS OF THE STATEMENT

Pans run over a year without material repair. The pans "Take all the shale they can feed into them." They are well pleased with results. Original screen plates on one pan lasted over a year. Days run for two pans was 405 tons, and on two others, 450 tons of shale.



American No 57 Dry Pan

HERE'S WHAT GIVES THIS RECORD CAPACITY

Extra heavy construction. Great screening capacity. Correctness of design. Quality of material. Excellence of workmanship. Wear-well gear metal. Long lived step bearings. Long shaft bearings Planed joints. Lock nuts and our extensive knowledge of the requirements of a heavy pan for doing heavy work. Let us send you a full specification sheet on the No. 57 pan. We also build other pans and every machine needed by the clayworker.

The American Clay Machinery Co.

BUCYRUS, OHIO

"Look Who's Here"

LOOK AT THE PROMINENT PEOPLE USING THE AMERICAN NO. 233 AUGER MACHINE AND WHAT THEY SAY ABOUT IT:

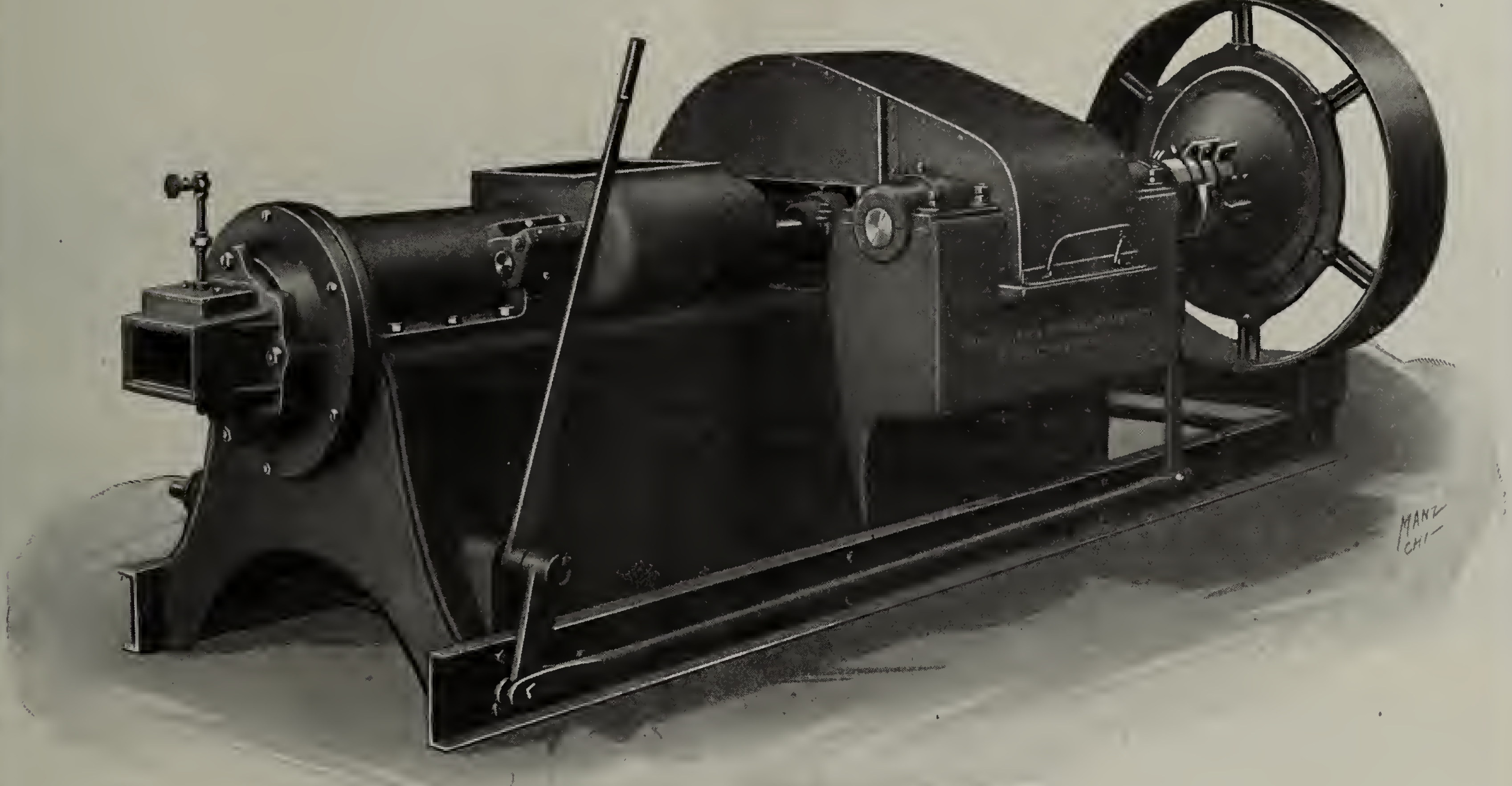
The Whitacre-Greer Fireproofing Co., says: We have nothing but praise for the American No. 233 Auger Machine.

The California Brick Company says: The American No. 233 Auger Machine is a wonder in quantity and quality of product. It gives perfect satisfaction.

The Auburn Shale Brick Company says: Your American No. 233 Auger Machine has been operating three years. It still has the original gears in good condition. It has been crowded to its capacity constantly. It is truly a marvel and its work unbelieveable.

Mr. W. E. Martin & Sons says: On your American No. 233 Auger Machine the power cost is less than on any machine we have ever used. Our only trouble is getting the product off the offbearing belt for it surely comes when you give it the clay.

WE CAN SEND YOU OTHER STATEMENTS ON THIS AND OUR OTHER AUGER MACHINES



This machine is well adapted to the manufacture of building brick, face brick, paving brick, and blocks, fire brick, medium sizes fireproofing, building blocks and drain tile.

Capacity per hour up to 7,000 standard size brick, 10 tons of fireproofing, 12 tons of drain tile or this equivalent in other wares.

The American Clay Machinery Co.

Bucyrus, Ohio.

"Living Cost?" What!!!

Why kick on the high price of Butter, Eggs, Meat and other provisions you buy?

So long as you pay twice as much as you should to burn your product you are not consistent if you complain on the cost of household items.

Suppose your cook paid these high prices for food stuff and then "THREW HALF OF IT AWAY."

That's exactly what you are doing at your plant.

Coal costs more than it ever did and you are using twice what you need for your kilns.

Moreover we offer to save half your coal and half your kiln labor and show you how the Haigh Kiln will pay for the entire improvement in a very few years. Why not look into this economy at your "PLANT" so that you may waste a little on "GRUB and GASOLINE."

It costs nothing to get full particulars on the possibilities in your own plant for burning cheaper and better.

Let our Mr. Haigh take this up with you

The American Clay Machinery Co.

BUCYRUS, OHIO.

EDITORIAL NOTES AND CLIPPINGS.

The C. & B. Clay Company, of Canton, Ohio, has increased its capital stock from $75,000 to $100,000.

The plant of the Salina Vitrified Brick Company at Salina, Kan., was slightly damaged by fire which started in the dryer.

A fire which virtually destroyed the sagger house at the United State Encaustic Tile Works, Indianapolis, caused damage amounting to $3,000.

The Stevens Pressed Brick Company has been organized at Cincinnati, Ohio, with $25,000 capital. Arthur W. Murray is at the head of the company.

The Forest City Sewer Pipe Works at Toronto, Ohio, resumed work March 12, after having been closed several weeks on account of inability to get coal.

The Maine Wire Cut Brick Company has been incorporated at Lewiston, Me., by William J. Mahoney and M. Lemieux, of Lewiston, and Harry Day, of Auburn, Me.

The Athens Brick Company, of Athens, Ohio, and the C. P. Mayer Brick Company, of Bridgeville, Pa., are recent additions to the Dunn-Wire-Cut-Lug Brick family of licensees.

Thomas J. Banks & Son, of Cleveland, Tenn., have purchased a tract of land on which they will erect a pressed brick plant. They expect to have same ready for operation by the first of May.

W. E. Langenberg, head of the Langenberg Brick Company, of Stevens Point, Wis., died at his home there recently. He was sixty years old and had been engaged in the brick business for many years.

The Brooklyn White Brick Company, of Brooklyn, N. Y., has been incorporated to manufacture and deal in brick, terra cotta and ceramics. H. A. Johnson, C. Slaughter and S. Grant, of 189 Montague street, Brooklyn, are the incorporators.

The Hoytville Clay Company has been incorporated at Hoytville, Ohio, for $30,000. It will manufacture tile, building blocks and other clay products. The company is composed of citizens of Hoytville and vicinity. Dr. Dan B. Spitler is president.

The North American Brick and Clay Company, which was incoporated recently to manufacture brick at Mansfield, Ohio, plans to start work on the plant as soon as weather conditions permit. The company has sixty acres of valuable clay land adjacent to the railroad.

The plant of Klose & Co., at Aurora, Neb., which has not been operated for some time is being put in shape for operation early in the spring. H. E. Funk, of Doniphan, Neb., has bought an interest in the concern and will have charge of the work of remodeling the plant.

The Reynoldsville Brick and Tile Plant, Reynoldsville, Pa., is undergoing its annual winter repairs and among other things a new steam power plant is being put in to furnish more power for the increasing production of the company. The outlook for 1917 is the best in the company's history.

The case of Elmer Pierce against the Indiana Paving Brick and Block Company, of Brazil, Ind., in which the plaintiff sought $25,000 damages for the loss of an arm while at work in the shale pits near Brazil, was compromised for $3,500 just after it had been called for trial before a jury in the circuit court.

Charging that smoke and fumes from the A. P. Green Fire Brick Company's plant at Mexico, Mo., have damaged her orchard and home and have injured her health and that of her husband and daughter, Mrs. Mary W. Howard has brought suits for damages to totalling $13,000 against the company. One petition asks for $5,000 damages, the other $8,000.

The Muskogee Vitrified Brick Company, one of the livest industries of Muskogee, Okla., has orders for a total of more than 5,000,000 bricks to be delivered to many different places in this section of the country, according to a statement issued recently. Since the Muskogee Vitrified Brick Company was reorganized nearly a year ago, it has given steady employment to sixty men.

The Gill Clay Pot Company, of Muncie, Ind., has increased its capital stock from $20,000 to $100,000.

Warren B. Ferris Brick Company, of Columbus, Ohio, has certified to an increase in capital stock from $50,000 to $100,000.

The American Clay Machinery Company, of Bucyrus, Ohio, has increased its capital stock from a half million dollars to one and a half millions.

Athens Pottery Company, Athens, Tex., recently incorporated with $60,000 capital stock, plans plant to manufacture tile and other clay products. P. E. Miller is interested.

Interstate Clay Company is the new name of the former Southern Clay Company, of Sumter, S. C., the charter having been amended to make the change of title. A. C. Phelps is president and treasurer.

Nicholas Hogan, a pioneer brick manufacturer of Peoria, Ill., died at his home there recently, after an illness of ten days with pneumonia. Mr. Hogan was eighty-seven years old and had lived in Peoria for seventy-five years.

The class in bricklaying at the Dunwoody Institute, Minneapolis, Minn., closed March 1. This class is conducted for only two months every year during the season when work is scarce. Its members are paid half time for the time they spend in class.

Edward Milbrath and H. W. Ahrens, of Okabena, Minn., are interested in a movement to establish a brick manufacturing plant at that place. The new concern, which will be known as the Okabena Clay Company, will be incorporated with $125,000 capital stock.

The brickmaking plant of the Anaconda Copper Mining Company, of Helena, Mont., is to be enlarged in order to increase its capacity. The company is making a number of improvements in its work, including the erection of a mammoth stack, which alone will take about 25,000,000 brick.

The Albion Shale Brick Company, Albion, Ill., has become a licensee of the Dunn Wire-Cut Lug Brick Company, of Conneaut, Ohio, and will manufacture wire-cut lug brick. This addition to the list gives the Dunn Company forty-four licensee companies, operating sixty-nine plants in twelve states.

Incorporation papers have been granted for the Baltic Clay Products Company, with capital of $50,000, to take over the Pershing brick and tile plant at Baltic, Ohio. Incorporators are James M. Rinehart, S. Gerber, W. D. Center, L. T. Pershing and Edw. F. Steiner. The company will enlarge its plant.

One of the largest transactions in brick circles in central Michigan was consummated recently when the Michigan Face Brick Company, of Grand Rapids, contracted to take the entire output of the Grand Rapids Brick Company, which means the manufacture and disposal of 25,000,000 common brick annually.

The Springfield Brick Company's plant, southeast of this city, is being enlarged and improved to meet the great demand now being made for paving brick, according to announcement of officials. It is probable that the company will do away with the manufacture of building bricks, because of the demand for the paving bricks.

A peculiar accident occurred at the plant of the Streator Clay Manufacturing Company's plant at Streator, which resulted in the death of Andrew Lesak, an employe. He had been working around the clay bin, which was nearly full of finely pulverized clay, and in some manner fell in and was strangled by the fine dust before he could be rescued by his fellow workmen.

The new plant of the Gates Fire Clay Company at Colchester, Ill., started operations March 1, manufacturing flue linings and sewer pipe. The plant starts with four kilns, and four more will be built as needed. A. W. Gates, the manager of the plant, is an experienced clay man, having been connected with the Monmouth Mining and Manufacturing Company, one of the largest manufacturers of sewer pipe in the country.

The Elliott Building Tile Company, of Bismarck, N. Dak., has been incorporated with $150,000, and work on an immense plant will be started as soon as weather conditions are propitious. The officers of the company are: President, Andrew Pierson; vice-president, A. Martin; treasurer, C. A. Williams, and secretary and general manager, W. J. Elliott, formerly of Dickinson, N. Dak., where for several years he was manager of the North Dakota Press Brick Company.

George O. Woodelton has leased the plant of the Ithaca Brick and Tile Company at East Ithaca, N. Y.

Warren J. Jennison has purchased the interest of C. P. Slater in the Fairview Brick Company, Fairview, Minn.

Work has been started on four new kilns for the Petersburg Fire Brick and Tile Company, Petersburg, Ohio, which will greatly increase the output of the plant.

Saxon China Company, of Sebring, increased its capital stock from $150,000 to $650,000 today, owing to extensive improvements being made and large additions to the plant.

The Banks-Mitchell Company, of Chattanooga, Tenn., was recently incorporated by L. A. Banks, L. W. Mitchell, A. Shalliday and others. A plant will be erected for the manufacture of brick.

The Burke Brick and Tile Company, Fort Smith, Ark., has been incorporated, with a capital stock of $75,000, by H. C. McKinney, H. W. Hardy and George S. Miles and will equip a clay-working plant.

The Champlain Brick Company, Mechanicsville, N. Y., which has operated only a portion of its plant for several months, on account of the scarcity of wood and coal, started up its plant in full March 1.

Mason Chilcote, who has been general manager for the Ohio State Brick Plant at Junction City, Ohio, ever since the plant was started, has tendered his resignation and will move to Oskaloosa, Iowa, where he will assume the management of the Oskaloosa Paving Brick Company.

At the recent annual meeting of the stockholders of the Fort Wayne Brick Company, Fort Wayne, Ind., the following officers were elected: President, Henry Hilgeman; vice-president, Max Irmscher; secretary-treasurer, Henry Keller, and manager, James Ford. The reports of the officers showed a very satisfactory year, with prospects bright for even better business in 1917.

The Haws Refractories Company, of Pittsburgh, has just consummated a deal by which it takes over the plant of the A. J. Haws & Co., at Johnstown, Pa., and additional properties in surrounding counties, approximately in value something like $800,000. This deal, it is said, is the first in a campaign of plant extension and improvement. A new fire brick plant has just been started by the company at Lewistown Narrows, which will have a capacity of 80,000 fire brick per day.

That the plant of the Richmond Pressed Brick Company, owned by the Los Angeles Pressed Brick Company, will be made the largest of its kind on the Coast is the announcement made by Superintendent John Gerlach. Work is to begin at once on enlargements and the installing of a vast amount of new machinery that will cost altogether $150,000, and will greatly widen the output of the works. Clays are now being shipped from the mountains in large quantities by these works.

L. D. Binyon and James A. Hogan, of the S. S. Kimbell Brick Company, of Chicago, and Ben S. Fisher, of Union Furnace, Ohio, have leased the plant at the latter place which for many years was operated by the Columbus Brick and Terra Cotta Company, under Mr. Fisher's management. The company met with financial reverses a year or so ago and the plant was closed down. These three men are among the livest of live wires in the face brick business, and we congratulate them on their new venture, and predict a bright future for them.

Daniel E. Reagan has tendered his resignation as president of the Hocking Valley Products Company, Columbus, Ohio, effective April 1, in order to devote his entire time to other business interests and to a number of patents in which he is interested. Mr. Reagan is known throughout the brick world as the inventor of the rug or rough faced brick, which is being manufactured by twenty-six licensees. S. L. Chamberlaine, of New York, was chosen president, and Sidney S. Schuyler, of New York, vice-president. Frank J. Shaffer, of Columbus, was re-elected secretary-treasurer.

Thomas F. Morrissey, president of the Troy Brick Company, Troy, N. Y., died at his home in Lansingburg, N. Y., March 2. Mr. Morrissey was born in England fifty-nine years ago, but had resided in this country ever since he was three years old. He started the Troy Brick Company when he was but eighteen years old and conducted the affairs of the company until twelve years ago, when it was made a corporate concern with Mr. Morrissey as president. A wife, one daughter and two sons survive.

Walter M. Pratt, Earlville, Ill., advises us that he is in the market for a good second-hand pulverizer.

The Moomaw Clay and Tile Company, of Stonecreek, Ohio, is soon to be incorporated with $200,000 capital stock. The new company will manufacture face brick.

The Southern Clay Products Company, of Huntington, Ind., has been incorporated with $60,000 capital stock, by Fred B. Adams, Daniel Reutepohler and C. Mandel Dowell.

The American Manganese Steel Company, of Chicago, announces that M. B. Myers, formerly assistant to the vice-president of the company, has been appointed to the office of sales manager.

The Champlain Brick Company at Mechanicsville, N. Y., which has operated only a portion of its plant for some months past on account of a shortage in fuel, has started its plant full handed again.

The Columbia Clay Company, Uhrichsville, Ohio, writes that they are in the market for two second-hand nine-foot dry or wet pans, one Freese brick machine and steel dryer cars, all in good condition.

L. B. Wilson, general manager of the Cameron Clay Products Company, Cameron, Pa., writes that he is looking for two good burners, to whom the company will give satisfactory employment, and comfortable living quarters.

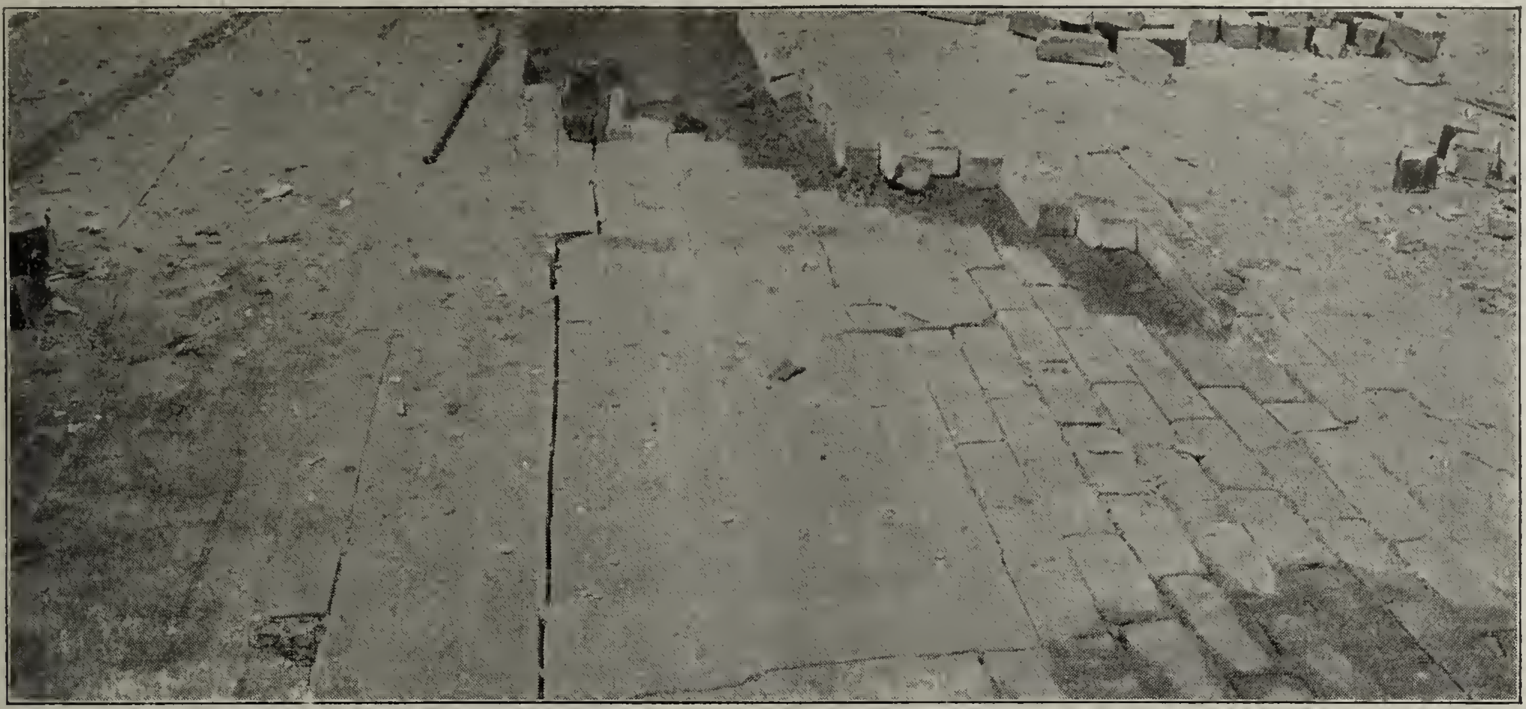
The Western Paving Brick Manufacturers' Association, with headquarters in the Dwight Building, Kansas City, Mo., announces that Mr. Clark R. Mandigo has been appointed consulting engineer, in charge of the association's service department. Engineers and other officials interested in municipal and road problems are urged to consult Mr. Mandigo freely.

The plant of the Red Shale Brick Company, Rapids City, Iowa, was completely destroyed by fire early in March. The cause of the fire is not known, but it is supposed to have started from defective wiring, as the burning of the last kiln had been finished a couple of days before the fire. The explosion of some dynamite, which had been stored temporarily in the office, caused considerable damage and no little excitement. The work of rebuilding the plant will be started at once, and it is expected to be completed within sixty days.

Nature sprung a streak of good luck the other day for the Roseville Paving Brick Company, at Roseville, Ohio. The company owns a large tract of land at its Roseville plant and not until by the freezing and thawing process of last week, when a bank on the place caved in, was it known that there was any coal on the place, but the bank caved in the other afternoon when the ground had thawed out and revealed a strong four-foot vein of coal of a splendid quality, and since then the company has been mining its own coal, and the farther in the bank they penetrate the wider and deeper the coal vein becomes.

Frank Kasten, of Blue Island, Ill., president of the United Brick and Clayworkers' Union, and Thomas Hutson, president of the Brazil (Ind.) local of the organization, were sentenced to jail by Judge A. B. Anderson in the federal court March 2, when they were found guilty of criminal contempt. Kasten was sentenced for six months, in addition to which the costs of the contempt case were assessed against him. Hutson's sentence was four months. The sentences were the outgrowth of alleged violations of a federal court injunction granted several months ago during labor troubles at the plant of the Clay Products Company, of Brazil. The injunction was to prevent interference with employes of the company.

The current report of the National Fireproofing Company, Pittsburg, Pa., shows a net earning of $100,412 for the year 1916, against a deficit of $98,907 in 1915. The usual depreciation charge of $100,000 was made from surplus. President W. D. Henry, in his report to the stockholders, says that while trade reports indicate a large amount of building to have been contracted for in 1916, when these reports are analyzed it will be seen that the work consists chiefly of factory buildings and structures of a more or less temporary nature in which the products of the company were not required to any material extent. The labor situation was a serious factor. Orders booked by the sales department were satisfactory. The car shortage was most severe during the last two or three months of the year, and interfered with deliveries to such an extent as to cause the cancellation of a number of orders. In the last quarter of the year the demand for clay conduits became more active than at any time during the past ten years.



Intersection Creighton and Alice Avenues, Ohmer Park, Dayton, Ohio, showing results of expansion in grout-filled, block pavement.

Barrett's PAVING PITCH

It wouldn't have happened with pitch filler

THIS brick pavement was laid with cement filler. That made a solid monolith of it. The tendency of a brick pavement is to expand in hot weather and contract in cold weather, but they tried to ignore this law.

For the first four years after the pavement was laid, nothing happened. Then one hot day last summer, passers-by were astonished to see this pavement suddenly bulge up and snap, making a ridge about fifteen inches high. Under the terrific tension, bricks were broken as if they were made of chalk.

So they closed the street and took out several rows of bricks and persuaded the pavement to lie down again. When repairs were completed there were several ugly scars in the shape of jagged cracks filled with cement. This repair work, having been done in summer weather with the bricks at the summer state of expansion, it will be interesting to see the cement try to hold the bricks through the strain which the contraction caused by winter weather will surely set up. The logical effect of the shrinkage of the bricks will be ugly, irregular cracks through which water and frost will seep down to the foundation to start further mischief.

The right way to lay a brick pavement is with Paving Pitch. Then every joint becomes an expansion joint. A cement-filled pavement is full of all sorts of invisible strains and stresses, but a pitch-filled pavement is under no strain whatever. Pitch will last as long as the brick and maintain always an unbroken waterproof protection to the foundation. Pitch is cheaper than cement and permits removal of bricks for underground repairs. It makes a quieter and less resonant pavement.

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MONOLITHIC BRICK PAVEMENTS

(Continued from page 261.)

Air Cushion.

Probably another reason for the lack of bond between the base and the brick is the air cushion formed at the time of laying of the brick. A brick layer will probably lay 30,000 bricks per day; at this speed he has no time to make a drawn joint in order to eliminate this fault. As suggested, when the dry mortar bed is used it should be scored in such a way as to allow the air an avenue of escape at the time of laying, then this unevenness could readily be taken up at the time of rolling of the brick and every brick would have an even base.

Templet.

Upon a recent job the templet used to bring this dry cushion to an even crown was merely a board guided upon thin strips of wood, with the dry mortar bed previously scattered to an approximate depth. This method gives no chance for the weight of any quantity of material to bring the water from the concrete under the mortar bed, as may be the result of the use of a heavier templet where a quantity of material may be stored in front of it. The use of the heavier templet may or may not be the solution of a dry mortar bed. I doubt if it will give a great deal more efficient bonding qualities.

Weight of Brick to Draw Moisture.

The theory has been advanced that the weight of the brick will bring the moisture from the base beneath to the surface of the mortar bed, but I do not think this condition can hold good where the moisture in the base is not sufficient to thoroughly saturate the mortar above. The mortar bed obtaining the moisture in this way by a very slow process, and then not to a very great extent, never has the plastic qualities it should have. Such methods could not be used in the laying of brick in a wall or any construction purposes of that nature. Mortar in these conditions is always in a very plastic condition and adheres to brick.

Lack of Uniformity of Water.

Lack of uniformity in the amount of water used in a base is another undesirable feature. While one batch of concrete may be very wet and quaky at the surface, an adjacent batch may be quite the other way. These unlike conditions should be avoided, if possible. The use of water, by thoroughly sprinkling the brick before grouting may make up for the lack of moisture, but it is a question if it will produce a result as satisfactory as if the cushion or mortar bed had previously been of the right consistency. The water used in this way may or may not be of sufficient quantity to thoroughly saturate the base under the surface of the brick. It is also doubtful if water applied in this manner would reach the central portion under the brick in sufficient time to give it the plastic quality that would cause it to adhere to the brick. Scoring the dry mortar bed about ¼ to ½ inch deep, and about 1 inch or 1½ inches apart, parallel to the roadway, may have a tendency to allow the water applied before the grouting upon the surface of the brick to reach every portion of this mortar bed.

The use of the wet mortar bed does not, however, eliminate trouble from air cushions, and I think the same process of scoring the wet mortar bed could be applied to good advantage.

Washing Brick.

It is customary in laying a job of this character to pile the brick alongside the road before any work is started. The brick becomes dusty from traffic, and should be thoroughly washed before they are used in the pavement. Washing the brick also gives it an added value, that of more closely adhering to the mortar bed. Wetting of the brick is very hard on the bricklayers' hands, but it seems a remedy could be secured for this.

Another feature of the use of dry mortar bed was called to the writer's attention where the parting of the surface from the base, or both from sub-base followed at the apex of grade changes. This may not occur at every change of grade, but it will where there is sufficient change to create an arch by the expansion of the brick or both in combination through any appreciable length of the pavement. A few places where this parting occurred upon recent work, examination showed a hollow condition of about five feet on either side of a crack that appeared upon the surface. These cracks were due to bulging of the surface, or surface and base combined, and were not uniform in appearance. Expansion that will create such a condition has shifted the brick through some appreciable length, and the result of such shifting is inevitable, namely, the ravelling of the brick where these cracks appear. It is much more desirable, then, to place expansion joints at regular intervals extending through the base.

The writer would suggest that these expansion joints be not over a quarter of an inch thick, and not to exceed 100 feet apart, in some instances not over 30 feet, where the foundation shows any unevenness in its settlement. Expansion joints at shorter intervals will allow the pavement to settle as a slab and prevent any cracks due to settlement.

Difference of Temperature, Base and Surface.

As shown in the previous tests, expansion of concrete and brick beam, or monolithic construction, are almost identical with plain brick beam. The difference in temperature between the base and the surface must be but slight, it is reasonably certain that the concrete base absorbs some heat from the brick surface, and the difference in temperature cannot be very great. Under these conditions concrete would expand and contract with the surface brick, giving every opportunity to the brick to keep its original bond with the concrete base.

Expansion Tests Demonstrate Bond.

In the tests conducted on expansion a very good example of the bonding value of brick upon concrete was demonstrated. The monolithic beam which was two courses of vertical fiber brick laid flat and grouted one to one, on a half inch mortar bed, and a 1-2-4 concrete base. This beam was practically 11 feet long. In bringing the temperature from 0 degrees Centigrade to 99 degrees Centigrade, it showed no signs of failure between the bond of the base and the brick. This test was conducted by packing the beam in ice for twenty-four hours, and then bringing it to boiling point in a vat constructed for the purpose. It was left in boiling condition for about thirty minutes. Upon removing the beam from the vat to the outside of the factory it was dropped, breaking at the middle. Half of this beam was then taken outside, and ice cold water thrown upon it. The brick and concrete still held together even after this severe treatment.

If a bond of this character could be secured in practice, there would be no question as to the ideal construction of the monolithic type, and the failure at the expansion joints would not be any cause for worry due to the ravelling of adjacent brick. Ravelling of adjacent brick at the expansion joint could be eliminated to a great extent, if not entirely, by laying the bricks on either side of this expansion joint parallel with the length of the pavement. The only question this might cause would be the unsightliness, which I do not think worthy of consideration if a greater value in pavement could be secured thereby.

Example of Contracting.

Returning to the question of contraction, we will assume a pavement of a combined thickness of 7 inches, and 20 feet in width, and that the total friction is equivalent to half its weight and half its length. There would be created in 100

(Continued on page 296.)

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MONOLITHIC BRICK PAVEMENTS

(Continued from page 294.)

feet a friction of 46,640 pounds. Assuming a drop in temperature from 80 degrees Fah. that would give a contraction of .2628 inch. Again, assuming the tensile strength of this construction to be 150 pounds to the square inch, 1,680 square inches would give a total of 152,000 pounds tensile strength. This is in excess of the frictional resistance of a pavement 100 feet in length. However, if the pavement were 500 feet long there would be a frictional resistance of 233,280 pounds, which is considerably in excess of the total tensile strength. It can be seen that the limitations are in the neighborhood of about 400 feet between expansion joints, if there is only 60 degrees change of temperature assumed.

Replace Expansion Joints With Cement.

More frequently brick pavements are laid during hot, dry weather, and the drop of temperature may range from 90 or 100, to 0 degrees Fah., or even below. These internal stresses of brick pavement are most vital to the life of the pavement. If there is any means of taking care of them, it should most certainly be adopted. If by the use of expansion joints at shorter intervals, say of 30 or 50 feet, after a period of a few years it can be seen that the expansions are not desirable, it is a very easy matter to replace this expansion material with cement grout, where, on the other hand, it is a very difficult matter to correct the fault of expansion at the time the expansion is at its maximum, doing its greatest damage, or vice versa, by its contraction.

Removal of Brick Course.

If the expansion were taken care of during the time of its greatest elongation by the removal of a brick course, it would allow the entire brick surface for a considerable distance along each side of such removal to shift from its original position upon a new, uneven base. On the other hand, if expansion joints were used, extending through the base, expansion and contraction would not create any serious damage to the pavement, and any fault found with ravelling or breaking down at these joints could be corrected, as previously stated, by the use of cement filler.

Shrinkage Concrete.

The shrinkage of concrete during the first 12 weeks is an item that should not be overlooked, or fail to receive consideration in the question of expansion joints. Consdire in his work on reinforced concrete gave a value of 0.03 per cent. to 0.05 per cent. shrinkage for lean mortars, corresponding to a contraction of about ½ inch in 100 feet. (These figures are based upon concrete cured in air from the time of the original pouring until such time as the concrete has reached the limit of shrinkage, during the time of setting.)

It must be borne in mind that hardening has nothing to do with the temperature, and does not vary with it, but is an additional item to be taken care of in concrete construction. This contraction, or shrinkage, appears in hair cracks about every 30 feet, or less.

Shrinkage Partly Corrected.

The shrinkage due to this fault is partly corrected by the layer of a more or less air tight covering, namely, the vitrified brick, but could not be expected to eliminate this shrinkage entirely.

There is one thing certain, and that is, the contraction of the grout filler is negligible from the above cause, and should any severe temperature change take place, causing an extreme expansion before the setting of the base, may cause the surface sufficient to part the brick from the base. From these conditions it can be seen that expansion joints at short intervals are more desirable, especially is this true for the first 60 days, or even a period of a year.

Reducing Brick.

The tests previously stated demonstrate the advisability of the reduction of the thickness of the brick for surfacing material. For comparative purposes, as shown in the tabulated form, I have reduced them to a common basis of cost of materials, no attempt being made to include the cost of labor of the various types. These prices, $2.20 for cement, and $1.20 for sand and for gravel, and $25.00 for vertical fiber brick of 2¾ inches, and $32.00 for 3½ inch brick, I assume to be the average cost of these materials delivered upon the job, in the vicinity of King county. I have assumed test No. 5, which is the 1-3-6 base with a 2¾ inch surface, as 100 per cent. in cost as well as 100 per cent. in relative value of strength. From this tabulated list it can be seen that the old style construction for material cost approximately 25 per cent. more than the previously mentioned type. These cost figures are only arbitrary, and will not apply to different parts of the country.

Again, for example, it can be seen that the use of the 1-3-5 base, 5 inches thick, with 2¾ inch brick, costs 95 per cent. of the 1-3-6 base, 6 inches thick, with the same surface, yet it only has a strength of 87 per cent. From another example it can be seen that the use of 1-2-4 base, 1 inch thick, with 3½ inch brick surface, would cost 95 per cent. of the previous mentioned type, and only have a strength of 44 per cent.

A peculiar instance of the cost of material of 1-2-4 base, 4 inches thick, with 2¾ inch surface, is 93 per cent. of the cost of the 1-3-6 base, and the comparative strength is also 93 per cent.

From these figures it is very easy to pick out the most desirable form of construction to meet the demands of traffic that the pavement will be subjected to, together with the limited means which the project may encounter. Some of these cheaper forms of construction may be all that is necessary to meet the required strength upon some pavements such as boulevards where only light auto traffic is allowed, and roads of secondary nature, where there is not a continual traffic of heavy tonnage, or where there is an existing foundation of gravel or macadam.

It is to be noted the lowest drop in percentage of cost is only 81 per cent. in the 1-3-6 base, 3 inches thick, with 2¾ inch brick surface, and yet it has a drop in strength to 45 per cent. The fluctuation of cost does not follow the fluctuation of strength of the pavement. Quite often such a material reduction in cost would bring brick pavement in competition with many other types of pavement of less desirable character.

Dependable.

As a whole, I think more dependence can be given to properly constructed monolithic pavement than upon the old form of construction, and this feature is bound to bring this type of construction into more general use.

Reduce Cost of Brick.

One material advantage of monolithic construction that could be acquired by paving engineers, is the reduction of the cost of brick by the use of the kiln run brick. By this I mean eliminating the present process of grading into the three classes of No. 1 and 2 and highway brick, which is commonly practiced today. The strong tendency upon the part of engineers throughout the country to limit the quality of brick used in pavement only to the first grade has brought up the cost of this class, as the brick manufacturers are only able to sell No. 2's at a material reduction in cost. The most undesirable feature of No. 2 brick is the imperfectness of shape, which, by the use of the monolithic construction, is well taken care of by the insertion of the deformed side into the mortar bed. A saving of 10 per cent. in the brick could be accomplished in this way, and it would allow brick manufacturers to sell their entire output, whereas at present, the No. 2 accumulate and must be sold at a materially lower price in order to make yard room. This does not include culls or underburnt brick, which can be sold for building purposes. There is another cost at the plant, in the grading of these three classes, which would be eliminated by this method.

Concentrated Work.

Another advantage of the monolithic construction is due to the concentrated work in the process of construction. When all work is carried on at the same time there is a tendency to rush each individual department. The concrete must proceed fast enough to allow the brick to be laid—the brick must be laid fast enough to cover the concrete already laid. This may seem of no particular value, but it is a fact, nevertheless, that when one department of the work is dependent upon the other, there is a strong tendency on the part of one foreman to outdo the other.

Not Damaged by Rain.

Another advantage gained by monolithic construction is that should rain occur during process of laying of brick it would do no damage to the mortar bed, which is not true where sand cushion is used.

Repairs.

Instances have been cited where monolithic construction would not be desirable for city pavements on account of disadvantages of repairing the pavement after being torn up to allow the installing of public utilities. This same condition applies to asphalt pavement as it does to monolithic pavement. When monolithic pavement is torn up for such purposes, it is necessary that an entirely new base and new surface replace the torn up portion, as in the present where brick pavements are torn up a new concrete base replaces the old, the old brick are laid upon a sand cushion even if they all may be in halves after the process of removing. Again, when these bricks are grouted, it is not an uncommon practice to allow traffic over the repaired portions within a very short time after the work is performed. Grouting of brick with cement under these conditions is of no value whatsoever, and only gives opportunity for the adjacent brick, which is well bonded, to ravel.

If, on the other hand, monolithic construction had been used, the brick would be laid into a green mortar bed, and a green concrete base, grouted at the same time. This one unit of repair would be rigid in its form, providing traffic is kept from it until such period as it sets up in its proper form. It would also compel in a majority of cases the use of new brick, rather than cobbled brick that have been torn up from the site under repair. The use of new material is almost absolutely essential in any other type of pavement other than brick laid upon sand cushion.

Cleanliness.

The cleanliness of this type of construction is another desirable feature which should not be disregarded in the selection of type of pavement, as well as the elimination of the rumbling noise so common to brick pavement on sand cushion. This feature would make this pavement more desirable in cities and in residential sections where these factors are to be considered in the selection of the type of pavement.

Conclusion.

I think these arguments, set forth for and against monolithic form of pavement, well demonstrate the value of this new type, and the success of the monolithic construction is furthering the interest of brick pavements.

Every manufacturer of building brick should become an active member of the Building Brick Bureau and also an active advertiser in his own community.

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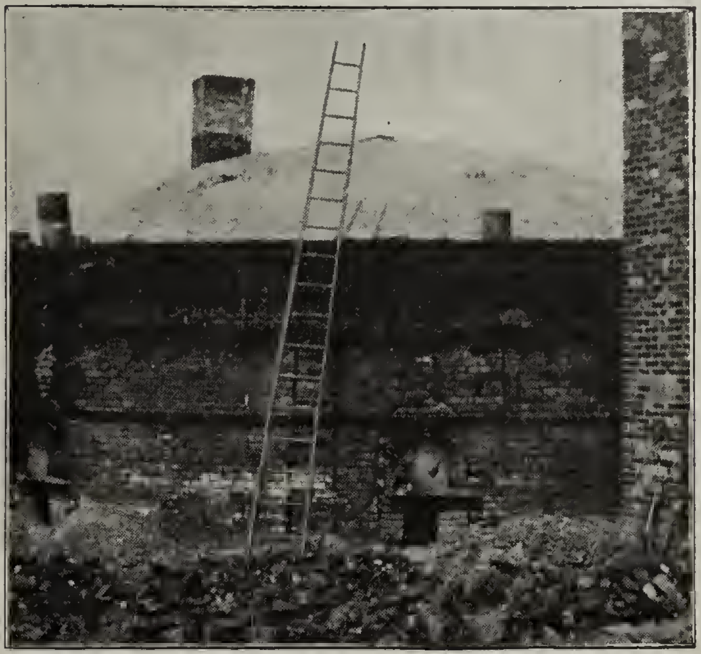

Hook Down-draft Kiln at Plant of
RUPP CLAY PRODUCTS COMPANY

Jasper, Mich., Feb. 2, 1917.
Hook Patent Kiln Co., Columbus, Ohio,
Dear Sir:—As I promised you I would let you know how my kiln is working, I will do so.
The kiln works fine with good results, and a saving of at least half the fuel and two-thirds of the time in burning, over the old system.
We get much better burns and I think we can burn it in less time than we have. We get even burns and don't have but a few checked tile.
I think if anybody is thinking of remodeling their kilns or building new ones they can't go wrong by putting in Hook Down Draft Kilns.
Yours very truly,
Lewis Rupp.

At this plant the Hook System was first installed in an old kiln.

We can make our first letter to you more interesting if you give us number and size of your present kilns, kind of fuel, clay and ware, together with present burning time and fuel consumption.

HOOK PATENT KILN CO.
High and Spring Streets
COLUMBUS, OHIO

KILN BANDS, GRATE BARS AND CLAY PLANT ACCESSORIES.

Cut Down YOUR Burning Cost

AND MEET THE ADVANCED PRICES OF FUEL AND LABOR. Scores of CLAYWORKERS have cut down THEIR burning costs from 25 to 50 per cent by the use of our IMPROVED METHODS. One company saved $792 on their first three burns in one of our 150 ft. Rectangular Kilns, another company $35 on each burn in one of our 26 ft. round kilns.

Our IMPROVED METHOD can be built into round or rectangular kilns, old or new at a moderate expense. In changing down draft kilns to our system it is not necessary to change furnaces or bag walls.

WE own and control all of MR. C. HOOK'S latest improvements in kilns, including his GRATELESS FURNACE DRY-KILN, and will say to you—

MR. CLAYWORKER we care-not who you are, or where you are any place in the UNITED STATES or CANADA, we will mail to your postoffice address, or express office. PLANS for our Improved Kiln, with full instructions for building and handling, and only ask you to pay us one third the value, on delivery. WE make you this offer for 30 days only. If you want to take the benefit of this liberal offer you had better write to us TODAY.

OHIO KILN CO.

MAIN OFFICE
VIGO, OHIO

Get our prices on
KILN ACCESSORIES
We can save you money

BURNING CLAY WARES

(Continued from page 255.)

the hard coal bed are quickly ignited in the furnace if secondary air is available and we have difficulty in getting the heat over into the kiln, while with the bituminous coal the unburned gases are carried into the kiln and burned in contact with the ware; or, in other words, we say the bituminous coal has a long flame.

Forced draft is especially valuable in the combustion of anthracite, in that it increases the rate of combustion which is essential because of the density of the coal.

The use of a steam jet also has possibilities, first in that it gives the forced draft, and second, because of the deep fuel bed a maximum percentage of water gas is developed.

Hydrogen has a combustion value of about 62,028 b. t. u., and since a pound of water contains one-ninth pound of hydrogen the dissociation of the water will consume about 6,892 b. t. u. If the furnace temperature is 3,000 degrees, there will be in addition to the heat by dissociation, the specific heat of the hydrogen and oxygen, which roughly will be 1,800 b. t. u., making a total of 8,692 b. t. u., which every pound of dissociated water will carry over into the kiln from the furnace. Air heated to the same temperature will carry about 800 b. t. u.

Bituminous coal has a tendency to cake and swell in the combustion process. When freshly fired, the volatile constituents are driven off, and these must be brought in contact with hot secondary air to insure combustion. The remaining coke is increased in volume compared with the coal, and in consequence closes up the air spaces and thus shuts off the supply of initial air. Because of this the fuel bed must be shallow and uniformly spread over the grate to get results. Not all bituminous coals are caking, but the tendency of all is in this direction, and the firing conditions are somewhat alike, although not identically so. Two types of furnaces are in general use for such coals—the flat grate and the coking table.

The former is too well known to need description, and the latter, too, although many clayworkers are using a coking table principle and do not know it.

The regular coking table is a flat surface upon which the fresh fuel is fed and where the volatile gases are driven off. These gases mingle with the air that is admitted over the coking table, and the mixture passes over the bed of glowing coals and is burned. Before adding fresh fuel the coke remaining on the table is pushed off into the pit, where a deep bed of fuel is maintained, and properly so because the coke is practically fixed carbon, and the proper burning conditions are those required for coke or hard coal.

The most common type of furnace is the inclined grate bar furnace, which is essentially a coking table and pit. When the freshly fed fuel is placed on the upper ends of the bars, it goes through the coking process just as it would on a coking table, and with successive firings it is worked down into the deep bed of coals in the ash pit.

The dry, bituminous coals and lignite do not cake and there is a marked shrinkage in volume from the time of firing. As they run high in volatile matter, it is essential that the fuel bed be relatively deep in order to maintain hot coals for the combustion of the gases.

Natural gas and oil firing to the uninitiated usually give a lot of trouble at first. The combustion largely takes place near the burner, and the result is an intense heat in the furnaces which does not go over into the kiln, especially the down-draft kiln.

The furnaces for gas and oil should be narrow and small, since a large combustion space is not needed, and it is necessary to leave large openings around the burners for the admission of air to take the heat from the furnaces into the kiln.

Each type of fuel and each fuel requires special treatment in order to get the best results, and no treatise on the subject could possibly direct how to get results out of any fuel selected at random.

The combustion gases, including carbon, and their reactions are as follows:

Carbon, $\frac{1}{2} C_2 + \frac{1}{2} O_2 = CO$.
Carbon, $\frac{1}{2} C_2 + O_2 = CO_2$.
Carbon monoxide, $CO + \frac{1}{2} O_2 = CO_2$.
Hydrogen, $H_2 + \frac{1}{2} O_2 = H_2O$.
Methane, $CH_4 + 2O_2 = CO_2 + 2H_2O$.
Ethelene, $C_2H_4 + 3O_2 = 2CO_2 + 2H_2O$.
Sulphur, $S + O_2 = SO_2$.

There is a series of hydro-carbons, but unless the combustion is very faulty they do not appear in the gaseous products of combustion, and the hydro-oxygen carbon are readily decomposed and result in carbon monoxide, carbon dioxide and water.

The heat obtainable from a fuel depends, of course, upon its composition. The combination of carbon with oxygen, of hydrogen with oxygen, of sulphur with oxygen develop a certain amount of heat units, and if we know the composition of the fuel we can determine the amount of heat.

The heat generated by a pound of carbon burned to CO is 4,374 b. t. u.; of carbon to CO_2, 14,544 b. t. u.; of CO to CO_2, 4,359 b. t. u.; of hydrogen to H_2O, 62,028 b. t. u.; of methane to CO_2 and H_2O, 26,315 b. t. u.; ethelene to C_2O and H_2O, 21,327 b. t. u.; sulphur to SO_2, 3,906 b. t. u; sulphur to SO_3, 5,040 b. t. u.

In making calculations of heat values, one must consider the condition of the resulting gas. For instance, in the above values, it is assumed that the H_2O returns to water, but as vapor it retains the latent heat and the values of hydrogen and the hydro-carbon as above given must be corrected in estimating the heat given up for kiln purposes, because there is no condensation in the kiln or kiln stacks. For example, a pound of hydrogen produces nine pounds of water, the latent heat of which at 212 degrees F. is 970 b. t. u. per pound, and the heat value as given above must be reduced 8,730 b. t. u. Similarly in the methane there are 2¼ pounds of water vapor, and in the ethelene 1 3-7 pounds.

The sulphur values given consider sulphur as a gas in which form we expect to find it in kiln gases.

The heat losses in kiln burning are distributed as follows:

(1) Evaporation of moisture in the fuel.
(2) Unburned carbon in the ash.
(3) Heat of the ash.
(4) Incomplete combustion.
(5) Excess volume of air.
(6) Heat of escaping gases.
(7) Radiation and leakage losses.

(To be continued.)

CLAYWORKERS SHOW THEIR PATRIOTISM.

Patriotism for the Stars and Stripes was shown in a marked degree at the Standard plant of the National Fire Proofing Company at Kearbey, near Perth Amboy, N. J., not long since. The company employs a large number of men who came to the United States from Hungary, Austria and elsewhere. Following the break with Germany, request was made to take up a collection to buy an American flag to hoist over the works. It was readily given, the amount each should contribute, however, being limited to 25 cents. Cheers arose when the flag was unfurled to the breeze, demonstrating in the mind of H. M. Keasbey, vice-president in charge of the eastern division of the company, that this country will find loyal sons in the men of foreign birth who have come to America to become citizens, to make this their home and to share in all the benefits granted by the constitution.

Conditions that spoil **ordinary** belting do not affect GANDY Thresher Belts. They are weather-proof and service-proof.

For thirty years they have given absolute satisfaction in all thresher work. Today they are used and endorsed by 30,000 threshermen. The ravages of rain, of dirt, of oil, of grease, do not harm GANDY Belts. They do not stretch, shrink or harden. These alone are tangible money saving advantages for *you!*

But more — they transmit maximum power because, being stitched cotton they hug the pulleys closely.

GANDY Belts are made to resist the hardest kind of work—and they *do.* They provide absolute satisfaction or you get a new belt *free.* There is no substitute for GANDY Belts.

The GANDY BELTING CO.
749 West Pratt Street
BALTIMORE, MARYLAND
New York Branch, 36 Warren Street

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ORIGINAL Boss SYSTEM

Drying and Burning

BOSS TEN-HOUR DRYER

Use either waste heat or exhaust steam.
No live steam. No direct firing.

BOSS SYSTEM OF BURNING BRICK

Applies to all types of kilns and will save HALF in your cost of burning.

Let us save Time and Money for you

JOHN C. BOSS CO.
Monger Bldg., Elkhart, Indiana

1917 Announcement

We can save you 25% of your fuel bill. No money until we do it. Don't you think this worth a stamp?

Then write to the

X. L. KILN & DRYER CO.
Box 269, Ottawa, Ill.

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Patent Attorney
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YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Vol. LXVII. INDIANAPOLIS, APRIL, 1917. No. 4

THE FACE BRICK GAME.

Attractive Display Rooms of S. B. Dobbs, 1218 Chestnut Street, Philadelphia, Pa.

THERE IS A TRITE saying "Once a brickmaker always a brickmaker," and it holds true as a general rule. There seems to be a subtle something in the brick game that once one becomes interested in it, it takes firm hold, a vital grip, as it were, that continues through life. Perhaps it is the fascination of turning a crude raw material into a permanent article of utility and beauty. Be that as it may, brickmaking is an inheritance in many instances. A case in point is that of the well-known Philadlephia face brick dealer, Mr. S. B. Dobbs, who has been a conspicuous figure in the industry for many years.

Reception Room, S. B. Dobbs Office.

Mr. Dobbs' ancestors for several generations were engaged in the brick business. His father manufactured brick in New Jersey, and his grandfather was in the same business in England. Mr. Dobbs learned the brick business in his father's factory and managed the same for several years. Twelve years ago he first launched his own business, securing an office in the Bailey building, 1218 Chestnut street, Philadelphia, in which building he is still located. At that time he had one small office, but in a few years the increasing business demanded another, and about eight years ago he extended his office until it embraced several rooms. Again, the increase of business has made it necessary to have larger quarters, and the present exhibit is one of exceptional interest as shown by the accompanying views.

The suite comprises about 2,000 square feet of floor space, running entirely across the end of the building. The entrance is from the corridor in the center of the suite, and the lobby commands a pleasing perspective—to the left, three large rooms with private rooms for the manager and bookkeeper. In this department, practically all the detail work necessary in the conduct of the business is carried on. There is also a large work room in which samples are stored and packed for express and parcel post. About the walls are reference sample cases, in which are kept official samples of the lines handled.

To the right are located the sales and exhibit rooms and the private office of Mr. Dobbs. Upon entering these rooms you are at once impressed with the symmetry and artistic beauty of the whole. The rooms are finished in mahogany, with mahogany furnishings; upon the highly polished floors are rich, deep green axminster rugs. The natural light is splendidly diffused, and the artificial lighting facilities, consisting of several large indirect lights of distinctly Grecian design, add an artistic touch seldom found outside of a studio. The atmosphere is warm and inviting, bordering on the picturesque.

One is impressed by the absence of that cold, formal commercial air of the average brick exhibit. There is a coziness and cheer about the place that makes one desire to sit down and muse and con.

But the surroundings are but the incident. The exhibit itself is beyond description. The panel idea is observed; there are four cases or walls of panels. One wall consists of twelve large panels, perfectly balanced in colors, with a happy co-mingling of the light and dark, the old-fashioned smooth and the very latest rough texture ideas. Another consists of ten large panels about four feet by five feet, devoted to the display of rough texture brick in the buff, gray and red shades, in both uniform and full range assortment. A third consists of sixteen panels, with the full northern light, combining display of border panel effects in various colored smooth brick, the porcelain grays, whites and granite shades, and the old New England Harvards; while the fourth consists of twenty-one panels devoted to the display of smooth red, buff and iron spot brick, also a large panel of textile brick, which is commanding considerable attention at the present time.

The furnishings of these rooms are original, a large directors' table in one room, while in the others are individual desks for the sales force.

Mr. Dobbs' private office is large and furnished in harmony with the sales and exhibit rooms. About the walls are a number of large reproductions of representative buildings, for which has has furnished the face brick, with photographs of many of the factories represented. This gallery is a striking panorama in suggestion; i. e., the factory, the product, the distributor, Mr. Dobbs and the finished structure.

A Corner in the Display Room of S. B. Dobb-, Philadelphia

This office has a Chestnut street exposure, directly opposite the Hotel Adelphia, one of Mr. Dobbs' silent salesmen, he having supplied nearly a million rough texture buff brick for this structure.

In addition to this office Mr. Dobbs maintains offices and exhibits in Washington, D. C., and Atlantic City, N. J., with agencies in all the large cities on the Atlantic Seaboard.

It has been Mr. Dobbs' good fortune to furnish more large representative jobs in the East than any other concern. Some of the more prominent ones follow: In the city of Philadelphia—the Curtis Publishing Company's building (two and one-quarter Kittanning brick), Lafayette building (three hundred and fifty thousand brick), Jefferson Hospital buildings (three hundred thousand brick), Adelphia Hotel (six hundred thousand brick), also the Stock Exchange building, Lyric and Adelphia theaters, Ritz-Carlton Hotel, West Philadelphia Y. M. C. A., Bellevue Court building, St. Patrick's church, St. Columbo's church and many apartment houses and dwellings throughout the city and suburbs. Throughout eastern Pennsylvania, representative jobs in every city; for instance, Second National Bank, Wilkes-Barre; International Correspondence Schools, Scranton; Lehigh county court house, Allentown; Pennsylvania railroad station and the Y. M. C. A. at Chester. The Washington office has furnished many large buildings erected in that city in recent years, among them: Congress Hall Hotel, Scottish Rite Temple, Hotel Harrington, and at the present time he is serving brick on the largest apartment house ever erected in Washington, the Meridian Mansions.

Mr. Dobbs' line comprises high-grade face brick, enamel brick, paving and fire brick and architectural terra cotta. In the face brick line he handles the products of twenty factories and represents one of the largest terra cotta concerns in the East.

First a brickmaker, schooled in the art from boyhood, Mr. Dobbs has been in the face brick business now about twenty-five years, in New York, Philadelphia, Baltimore and Washington. First, as salesman for the Hydraulic Press Brick Company, during which time he developed a very high quality of salesmanship and was one of the pioneers in introducing iron spot and mottled brick in the eastern market; and of late years he has played a leading part in the introduction of modern rough texture brick. Visiting clayworkers will always find a cordial welcome at Mr. Dobbs' office, and architects and prospective builders will find the displays of face brick and terra cotta there a source of inspiration.

While the farmer has the money to spare is a good time to sell him some real brick, before somebody else sells him a "gold brick."

BUTTON-HOLE TALKS.

Interesting Observations on Kansas Peculiarities.

WE WERE ROLLING along over the flat, level plains of western Kansas. Looking out of the window of the smoking compartment, the lanscsape was as flat as a billiard table. There was a western gale blowing and, as there had not been any rain for weeks or months, apparently never, the horizon was obliterated by dust. Just off the right of way there extended the old Santa Fe Trail, now windswept clean as a floor, along which we saw frequent autos and Fords as well as occasional prairie schooners, still holding their way westward along the old trail and showing that the old pioneering spirit still holds and that men are still restless, migratory and hopeful. The berries always look better a little further on. The wind fairly howled, there was nothing to stop it, the dust clouds whirled racing back and the finer dust penetrated the windows and ventilators and settled in our ears and necks.

W. D. Gates.

The only other occupant of the smoking compartment was a tall, gaunt man with a tanned and weatherbeaten countenance, but interesing and promising as a subject of information, if I could only get him started. It's surprising how much really interesting and valuable information one can get from such a man if the approach is right; so I was anxious to get him started and I had no difficulty for, looking out of the window, he began—

"That trail was started by men who were in a strange country and there was no one for them to inquire the way from, otherwise it wouldn't have been so straight. Wherever they inquire the way they get as diverse directions as there are diverse temperaments in man. So the first experimenter on this trail, there being no one to inquire from, just let the teams go where they wanted to. He was so disgusted that he didn't care and the team was just as disgusted and desperate as he was, and so they just put one foot ahead of the other and went to sleep walking, and so the trail lay straight and, there being no other track, of course all the others just followed it. That's why it's there. That's the history of that trail. That's why it runs straight.

"Anyway, this country is fitted to its purpose. It only raises jack rabbits and tumble weeds, and the two belong together. Both luxuriate in a dead level country and an atmosphere of high winds."

Looking out of the window just then, he called my attention to a big, lop-sided tumble weed that the wind was racing across the landscape, now hitting the ground for a new start, then jumping high in air for another spurt, while just ahead of it was a terrified jack rabbit, scratching the earth in the wildest, most desperate attempt to keep ahead of the weed, apparently intent only on reaching New York in the quickest possible time. It was an even race and you could play no favorite. Doing his very utmost the jack could just hold his own and keep out of the way of the weed, and he was so terrified that he certainly was doing his utmost. Having watched them until they disappeared over the horizon, or, more properly, until they were lost in the distance, he resumed:

"That's a very proper distribution. One will wear out about as quickly as the other. The weeds keep going in this blasted country until they just naturally wear themselves out, and the jacks do just about the same thing. The weed hasn't any brain and neither has the jack. He hasn't much head and there's nothing inside the little he has, anyway. He's just legs and bone strung with catgut and they are fixed for running and nothing else. He's as wild as the wind and as hard to stop when once started. He'll just wear that weed out; that's what he will do.

"Really, you know, the wind is something awful, though. Takes all the soil off and moves it away, picks up one farm and piles it over on another farm, makes farming a hazard. One night you have a farm, next day you have only a hole in the ground. You had planned going to work on the farm and have to change all your plans and go to digging a little deeper and mining. Other fellows has a farm at night and in the morning has two farms, one on top of the other; has to lose all he had done on the under farm and begin all over again on the newer, top farm, and it embarrasses him. I knew one mighty smart fellow that thought he had a scheme that he could work through. He hustled and plowed his field and then went over it quick with a coat of glue, so it couldn't blow away. Grew a fine crop, and the glue held the roots so it couldn't blow away, and he was just full of chuckles. The day he harvested it there came one of these breezes—not what you would call a real wind, but what they would call a kind of a breeze out here—and it just took possession of this whole blooming crop, and a man over in Missouri threshed it.

"Another fellow had a theory that this was a great country for bees and that there were fortunes in that line. He went back east and bought them, putting all he had into them, and taking pains to see that he got the real honest-to-goodness bees—diligent, sober, industrious and above all, faithful. He brought them out here and then sat down to loaf and take the benefits while they did all the work. The thing figured out all right on paper, and he could see his way to competency, but he hadn't figured on these winds. The bees all came out and figured out their bearings, got the lay of the land as it were, located their landmarks so they could find their way home, as bees are accustomed to do, you know, and then they all went to it. Well, sir, the bees were all that they were recommended to be, filled all the specifications; but one of these winds hit it and it blew all those bees plumb across the state and over into Missouri. But the bees were game. They were sure true blue, and they hit the air trail back, and stuck to it, too. Sometimes they would gain a little, only to have a harder gust carry them back still farher. They got short of breath, their wings got frazzled, and they just naturally wore themselves out trying to get back. They do say that so faithful and honest and determined were those insects, that a whole lot of them tried faithfully and earnestly to walk back after they had worn their wings clean out."

It did seem as if there was a queer look in his eye as he left me, but he certainly was a well posted man. Isn't it wonderful how much real information you can pick up on a trip. GATES.

NEW YORK STATE CERAMIC PRODUCTS MANUFACTURERS' ASSOCIATION ELECTS OFFICERS.

As the result of a ballot recently taken, the following officers of the New York State Ceramic Products Manufacturers' Association were elected for 1917:

President—R. G. Eisenhart, Horseheads, New York, Consolidated Brick Co.

Vice-President—E. J. Lewis, Victor, New York, Locke Insulator Co.

Secretary and Treasurer—J. B. Shaw, Alfred, New York, Ceramic School.

Member Nominating Committee—M. A. Haley, Syracuse, New York, Onondaga Pottery.

The Association also voted to fix annual dues of $1.00 for students and $2.00 for all others. The association is in a healthy condition and the work it is doing in promoting the interests of ceramic industries in the state gives promise of making it indispensable to anyone interested in these industries.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART XI.

Evaporation of Water.

THE IMPRESSION seems to prevail that moisture in the coal or in the ash pit increases the heat development, but the contrary is the case. Every pound of water in the fuel or added to it requires 970 B.t.u. (at 212 degrees) to evaporate it. If the ware requires 1,000 pounds of coal per unit thousand of the ware and the coal contains 10 per cent. moisture, about eight pounds of the coal must be used to evaporate the water. Nor is this all. The thermal capacity of water vapor is about twice that of the other ordinary combustion gases for any given temperature, and this heat is taken out of the kiln. Nine hundred pounds of dry coal will give more available heat than 1,000 pounds of the same coal containing 10 per cent. moisture.

If the vapor rises through a bed of glowing coals it is dissociated and develops water gas (H CO), and this dissociation, relative to the hydrogen, will require the same amount of heat as that given up by the recombination (combustion) of the hydrogen, but we lose the excess thermal capacity of the water vapor.

The only excuse for the use of water gas is that it consumes a lot of furnace heat in the dissociation of the water vapor and conveys it into the kiln, where it is given up. In other words, water gas is valuable as a carrier of heat from the furnace to the kiln, and in many instances we can afford to pay something for this service; but there is a limit, and moreover, to be of any value whatever, the water vapor must be dissociated. If it is not dissociated every pound of water takes up 970 B.t.u. and the vapor removes from the kiln specific heat approximately double that of other gases.

Wood contains moisture up to 80 per cent., peat 60 per cent. or more, lignite 50 per cent., bituminous coal 20 per cent. and less, anthracite 5 per cent. These moisture contents must be reckoned with in securing economical combustion operations.

Unburned Carbon in the Ash.

Bleininger's tests of four industrial kilns, Trans. A. C.·S., Vol. X, gives us the following data:

	Per Cent Ash	Per Cent Carbon in Ash	Ratio Carbon in Ash to Coal Fired	Per Cent Heat Loss
Sewer pipe kiln.......	11.74	29.17	3.42	4.58
Paving brick kiln.....	14.09	21.53	3.03	3.09
Terra cotta kiln......	7.59	20.92	1.60	1.90
Terra cotta kiln......	6.55	20.53	1.34	1.60
Brick kiln	...	....	...	3.51

The average fuel loss in a clay-burning kiln is easily 4 per cent. of the coal fired, which, on the basis of 1,000 pounds of coal per unit thousand of ware, would be 40 pounds of coal. If a factory is using 25 tons of coal per day, it is paying for one ton to be thrown away and hiring men to haul it to the kiln, shovel it into the furnaces, rake it out of the ash pits, wheel it to the dump pile, and finally haul it away, besides committing a sin for which posterity must suffer.

The miserable grates that are used in brick kilns, with warped, sagged and irregularly spaced bars, cause a loss which might easily be turned into a profit. The purchasing department keeps a record of the cost of grate bars, but there is no record of coal in the ash dump.

Heat of the Ash.

Coals average 10 per cent. ash, and this falls through the grate bars at a glowing heat—let us assume 1800 degrees F. For every unit thousand of ware requiring 1,000 pounds of coal there will be 100 pounds of ash. If the specific heat of the ash is .16, there will be 16 B.t.u. per degree per unit thousand of ware, or a total of 28,800 B.t.u., which is equivalent to 2½ pounds of average coal.

A part of this heat is recovered in preheating the air, which must flow in over the ash before rising through the grate bars. The only point, then, is to have sufficient depth in the ash pit, that the ashes may accumulate and give up their heat to the incoming air. A shallow ash pit, which necessitates removal of the ashes after each fire, or at frequent intervals, to save the grate bars, is an unnecessary waste of fuel.

Incomplete Combustion and Excess Air.

The great kiln losses come from incomplete combustion, excess air and radiation.

If we put a gas coal or any hydrocarbon combustible in a closed vessel and heat it, we can drive off the gas and lead it away to a gas holder without recovering any heat from it except its sensible heat. If we burn this fuel in our furnaces without the proper amount of air, some portion of the gas passes through the kiln unburned and we lose its value. Every clayworker is familiar with the "tassels" of flame at the chimney tops, and usually is pleased in consequence of the "long flame" through the kiln. He would be less pleased if he appreciated the fact that the "tassel" is not the tail of the flame from the furnaces, but simply the unburned gases bursting into flame as they come in contact with the air, either at the top of the stack or in consequence of leakage of air through the stack walls. Likewise, a clear, transparent gas from the chimney tops is no evidence of economy in fuel nor of temperature. The kiln may be taking in a large excess of air, heating it to a high degree and expelling it through the stack.

The following table shows the temperatures which are possible from a bituminous (Illinois) coal under different air supplies and radiation losses up to 50 per cent. The table was calculated after the method given by E. Damour, in "Industrial Furnaces and Methods of Control":

Centigrade Temperatures from Bituminous Coal—Assumed Radiation Loss.

Air	None	10%	20%	30%	40%	50%
60%	1338	1219	1098	975	850	720
70%	1617	1480	1339	1193	1042	886
80%	1755	1610	1459	1303	1143	974
90%	1861	1708	1553	1390	1219	1041
100%	1943	1787	1625	1456	1280	1096
110%	1832	1682	1528	1368	1200	1025
120%	1730	1589	1441	1287	1127	963
130%	1642	1504	1363	1216	1063	900
140%	1561	1429	1291	1152	1005	855
150%	1486	1360	1229	1094	955	811
160%	1419	1296	1171	1041	908	773
170%	1357	1239	1118	992	855	
180%	1298	1186	1069	949	826	
190%	1246	1136	1026	908	788	
200%	1201	1090	983	871		

The temperatures are in Centigrade degrees and may be changed to Fahrenheit by multiplying by 1.8 and adding 32. One hundred per cent. of air is the theoretical amount for perfect combustion, and for such or greater amount of air we can be reasonably certain of the composition of the combustion gases and of the accuracy of the calculated results in consequence. Below 100 per cent. of air there is always uncertainty of the composition of the gas, with corresponding doubt in the calculated temperatures. The table illustrates the fact that it is possible to get somewhat higher temperatures with less than 100 per cent. than with more than 100 per cent., within a reasonable variation from 100 per cent. In the second column we get 1861 degrees with 90 per cent. of air, against 1832 degrees with 110 per cent., and likewise 70 per cent. is as good or better than 130 per cent., when we consider the oxygen taken from the ware to satisfy the gases, and also the undoubted kiln wall leakage. If a kiln is hanging up and it is evident that a higher temperature is required, the proper course is to reduce the draft, provided the draft is free, and at the same time close up the fires to shut off the excess air.

It may be that the kiln bottom is choked and that the air supply is exceedingly low, and there is no help for such a kiln condition. It should not have occurred.

Specific Heat.

Specific heat is the heat required to advance the temperature of a given weight of any substance relative to that required to advance the temperature of an equal weight of water through the same range of temperature, or more properly it is the heat, measured in calories or B.t.u., required to advance the temperature of a unit weight of any substance one degree.

Unfortunately, for simple calculations the specific heat of a gas is not constant, but instead increases with temperature.

For instance, hydrogen at atmospheric temperature has a specific heat of 3.37, while at 2000 degrees F. the specific heat is 4.05. If we had a pound of hydrogen heated to 2000 degrees the heat required to attain this temperature will be neither

$$3.37 \times 2000 = 6740 \text{ B.t.u., nor}$$

$$4.05 \times 2000 = 8100 \text{ B.t.u.,}$$

but will be an average between these two values, or 7420 B.t.u.

Recent investigations of specific heats of gases at high temperatures Fahrenheit give the following formulas for equal weights under constant pressure:

Nitrogen	0.2405 + .000012 (t-32)
Oxygen	0.2104 + .000010 (t-32)
Water vapor	0.42 + .00010 (t-32)
Sulphur dioxide	0.125 + .000056 (t-32)
Carbon dioxide	0.19 + .00006 (t-32)
Carbon monoxide	0.2405 + .000012 (t-32)
Hydrogen	3.37 + .00017 (t-32)
Methane	0.611 + .00021 (t-32)
Air	0.234 + .000012 (t-32)

Thermal calculations are much simplified by using equal weights, and for this reason we give only specific heats for equal weights. If the reader wishes to investigate thermal capacites of equal volumes he will find the specific heat formulas for such in "Coal," by Somermeier; "Metallurgical Calculations," by Richards; "Industrial Furnaces," by Damour, translation by Queneau.

In the use of the above formulas if we wish the specific heat at any given temperature, we must double the prefix of (t-32), but in combustion problems we seldom have occasion to determine such specific heats. If we wish to determine the heat in any weight of gas from atmospheric temperature to

If we wish to determine the heat in a gas between any two temperatures, as "T" and "t," we use the value (T+t) instead of (t-32) in the above formulas, first deducting 32 from both "T" and "t," and then multiply through by (T-t).

For example, the specific heat of nitrogen between 632 and 1832 degrees would be .2405 + .000012 (2400), and the heat in the gas between these temperatures will be

$$[.2405 + .000012(2400)]\ 1200 = 323.16 \text{ B.t.u.}$$

To convert the formulas to calories multiply the prefix of (t-32) by 1.8. The formula for the specific heat of water vapor, in calories, will be 0.42 + .00018 T, in which "T" is in centigrade degrees.

Theoretically, in the use of the formulas we should always take zero for the atmospheric temperature and for any temperature above zero we should use the values (T+t) and (T-t) in making thermal calculations, but practically we may use the formulas as given for any atmospheric temperature below 100 degrees Fahrenheit to any higher temperature, because the increment in the specific heat between freezing and 100 degrees is inappreciable and may be neglected.

With the formulas we can calculate the heat value in any gas and the following table has been determined from them:

Thermal Capacities of Gases.

Temp. F.	N CO	O	H_2O	CO_2	H	CH_4	Air	SO_2
32	0	0	0	0	0	0	0	0
232	49	42	88	40	681	131	47	27
432	98	86	184	86	1375	278	95	59
632	149	130	288	136	2083	442	145	95
832	200	175	400	190	2805	623	195	136
1032	252	220	520	250	3540	821	246	181
1232	306	267	648	314	4289	1035	298	231
1432	360	314	748	384	5051	1266	351	285
1632	415	362	928	458	5827	1515	405	343
1832	471	411	1080	536	6617	1780	460	406
2032	529	461	1240	620	7420	2062	516	474
2232	587	511	1408	708	8237	2361	573	546
2432	646	562	1584	802	9067	2676	631	623
2632	706	615	1768	900	9911	3008	690	704
2832	767	668	1960	1002	10769	3357	749	789
3032	830	721	2160	1110	11640	3723	810	879

Intermediate temperature capacities can be found direct from the formulas or by interpolation. Theoretically the latter does not give correct values, but they are near enough for practical work, and especially in view of the fact that the specific heats as determined by different investigators are not identical, and although the difference is small, yet it is greater than any error that would be introduced by interpolated values within a range of 200 degrees.

(To be continued.)

A MODERN BRICK PLANT IN THE BADGER STATE

An Up-To-Date Equipment Including the Underwood Producer Gas System of Burning

DURING the past fifty years clay products have been made at Whitewater, Wisconsin, and the value and high quality of the clay deposit was well known to many but the manufacture of brick and tile was only carried on in a limited way until recently, when a new modern factory was erected to make building brick, building tile and drainage tile on a very greatly extended commercial scale.

The Whitewater Brick and Tile Company was organized and incorporated by a number of progressive and energetic business men who appreciated the commercial opportunity and need of such an industry in the town.

The new company purchased the old plant with all its machinery, kilns, drying system, buildings, power, site, etc. They then bought a large tract of clay land, adjacent to the old plant and including a most desirable location for the new factory. A railroad switch more than a mile long was contracted for and installed at a cost in excess of ten thousand dollars. While the cost was high it is a most valuable asset as it affords a splendid means of receiving all incoming freight, coal, etc., and for the shipping of their tile and blocks to all the surrounding country.

One of the most modern and strictly up-to-date plants has been erected and placed in operation that is to be found anywhere in the country. All the buildings are constructed of steel frames and filled in with hollow building tile and brick and covered with asbestos roofing making them as near fireproof as possible. The machinery building is 108 feet long by 64 feet wide, thus providing for two outfits of tile machinery. The power house joins the machinery building at one corner and is 110 feet long by 50 feet wide and divided into two rooms, one for the engines and the other for boilers. To the south of the machinery building and parallel with it is located the dryer, and to the north is located the clay storage and clay grinding room, which is 50 feet wide by 125 feet long. The kilns are located to the east of all the buildings on a straight north and south line.

The power is furnished by a 350-h.p. Corliss engine during the day and at night by a 125-h.p. Corliss engine. 90-k.w. generator is in constant operation, driven by one or the other engine. The electric plant is to supply power when needed and not convenient to line shaft. Steam for the engine is furnished by two large water tube boilers. The water supply comes from their artesian well located in the boiler room. The water is nearly free of impurities, which is a condition of great value.

The machinery equipment is from the American Clay Machinery Company, Bucyrus, Ohio, and the J. D. Fate Co., Plymouth, Ohio.

The dryer is a sixteen track Justice Waste Heat type, while the fan and steam coil in connection with the dryer was supplied by the American Blower Co., Detroit, Michigan.

General View of the Plant of the Whitewater (Wis.) Brick and Tile Co.

The kilns for the plant are of standard type and design, 30 feet diameter round down draft and installed in connection with the Underwood Producer Gas Burning System. At the time the company was organized they contracted with the Manufacturers Equipment Company, of Dayton, Ohio, to do all the engineering work on the plant and to act in an advisory capacity on all matters pertaining to the purchase of all material and equipment and the construction of the plant and the placing of it in operation. The waste heat drying system which takes its heat supply from the cooling kilns and the exhaust steam from the engines; the Producer Gas Burning System; the kiln plans and iron work and the clay conveyor system were all furnished by the Manufacturers Equipment Company.

The plant is now in operation and is a marvel of completeness and simplicity.

The clay is a glacial deposit highly calcareous and twenty-five to thirty feet deep. It is free from gravel and very plastic, making it easy working on all the machinery. It has a high drying value, so the drying loss is very slight.

In the burning a temperature of 2180 degrees is necessary to mature the ware. The drain tile and building tile turned out is of a rich cream color and its quality has been pronounced by men of authority as being the best product of this character found in the state.

The company's affairs are presided over by an efficient board of good business men of which Mr. John C. Stier is general manager.

The Underwood Gas Producer, Producer House and Coal Bin.

CO-OPERATIVE GARDENING FOR PLANT EMPLOYES.

In these high-cost-of-living days, any scheme, suggestion or idea that tends to reduce the H. C. of L. is gladly received. For instance, back-yard gardening. Many families will live cheaper this summer by using a portion of their yards for food products rather than all of it for flowers.

But why hold the gardening proposition to house yards only? Why not use the back lots which are usually filled with weeds or rubbish? Why don't the large corporations let out unused portions of land surrounding their plants for this purpose. Some will no doubt say this last idea seems impracticable, but despite any and all arguments the plant garden idea has been tried with very good success. One of the country's largest corporations, the E. I. du Pont de Nemours & Company, has carried on the plan.

The above company has made a thorough study of "The Profitable Utilization of Idle Lands on Plant Property," having first considered the matter in 1913. The by-products division of the company recently decided that it was unwise and unprofitable to farm outright, and, therefore, decided as a general principle, to discontinue farming outright and to substitute farming on shares or renting the land. At one of the company plants last year, practically every acre available for farming was rented on the share basis or rented outright. This year, when the country needs all the food that can possibly be produced, all plant land is expected to be in demand.

In these strenuous times, why not all corporations offer the farming privilege to any reliable person or persons, be they employes or otherwise, on such a basis as would simply permit said corporation to break even. Then in case the "war time" necessitates that additional food be exported, the home gardener will have benefited himself as well as helped local conditions. In most parts of the country the time to start such work is NOW, so if you haven't a suitable back yard, get in connection with the nearest plant that seems to have available space and suggest the above plan.

THE LIME OUTPUT.

A preliminary estimate by G. F. Loughlin, of the U. S. Geological Survey, indicates a total marketed production of 4,150,000 tons of lime during 1916, a gain of 15 per cent. over the total of 1915.

This is the first year in the history of the country that the lime production has gone above 4,000,000 tons and the increase is notable, though not difficult to explain, when we consider that cement has been entering as a factor in the making of mortar for brick work. The explanation, while not set forth in this report, will probably be found in the fact that lime is being more extensively used than ever before as a fertilizer and for other purposes than building purposes.

One of the Kilns Fitted for Producer Gas.

Pennsylvania was the greatest state in the lime production and turned out about a fourth of the total, with Ohio in second place with a little more than half the production of Pennsylvania, and Virginia in third place with about a third of the production of Pennsylvania.

THE NEED OF BETTER PRICES

A Few Pertinent Facts Concerning Possible Ways and Means of Stabilizing the Industry

A Paper Read Before the Last Illinois Clay Product Manufactures Ass'n Convention

CONVINCING EVIDENCE that the clay products industry has not kept up with the times in the matter of prices and profits is furnished by the record of the industry itself as tabulated by the U. S. Geological Survey annually. Twenty years ago the price of common brick was practically what it is today, notwithstanding that the product of that period was much inferior as compared to the common brick product of today. Ten years ago common brick sold throughout the country at an average price of $5.97. During 1914 the average price was $6.12, making a difference of 15 cents. During the ten years, in which brick has increased only 15 cents per thousand, the price of labor has increased from 25 to 50 per cent., and in some cases 100 per cent.; the value of land has increased; other products entering both into the manufacture of brick and into building operations have increased in value all around us. In fact, the past ten years have marked an era of advance in values all around; yet, in the face of all this, brick manufacturers have gone ahead installing new machinery, improving the methods of manufacture, the process of burning, to the end that they may turn out a better product; and yet they have continued selling this improved product at practically the same price, year after year, notwithstanding the fact that everything else has advanced and their own cost of manufacture has piled up.

James E. Randall

Why is it? Why is it that the clayworkers throughout the country, who are undoubtedly men of intelligence, strong character and large calibre, have manifested a lively degree of enterprise in developing manufacturing methods, and have at the same time so generally neglected the commercial side of their business and have signally failed in the important matter of getting the price they should for their product.

A study of this question and of the kindred one of what it is that causes prices to go up and go down brings the conclusion that there are three factors which enter as influences in the matter of price—three factors that perhaps have been almost entirely neglected by the clayworking industry while it has been in pursuit of methods for improving manufacture and improving the product itself. These three factors are: (1) Knowing absolute cost of the product, (2) competition, (3) exploitation to enlarge trade.

The subject of cost is one that has been aired pretty thoroughly for several years now and emphasized at conventions and in public utterances until it would seem to need no further treatment. However, in face of all the attention this subject has received, Mr. Hurley makes the statement that out of the thousands of business men coming to the Federal Trade Commission for relief and being investigated, they find that only 10 per cent. really know the actual cost of manufacturing and selling their product. Surely if this condition applies to the clayworking industry as well as to others, it is time for an awakening and a checking up. One may gather from a study of the matter that many people in figuring their cost take due account of all the details of manufacturing cost, including that overhead represented by investment, insurance, etc.; but they do not take into consideration as they should the cost of marketing their product, that of advertising and selling, without which no product may be pushed successfully.

After all, however, it seems from a careful analysis of the proposition that the main trouble comes from competition. A man may know his cost and realize that he is cutting his profit margin close; but he has his investment, his employes, and turns out a product which he must find a market for in order to meet his pay roll and keep things going. He goes out into the highways and byways to sell this product, and there he meets up with buyers who show him tentative prices made by other brick men and tell him that he must go those prices a little better if he would get trade. It is this kind of thing that perhaps does more to create those conditions set forth by Mr. Hurley so impressively than anything else. No matter how we may argue about this talking point and that talking point, the stubborn fact remains that the price is a dominating factor in business getting, and when people crowd on each others' toes in the selling world and compete on the basis of making prices and going them a little better they are prone to sacrifice profits, even though they may know they are doing so. One man will make a sacrifice in a particular case because he needs money immediately. He may figure that this is the only sacrifice he is going to make, and that on his next bid in another case he will ask a fair price. Meantime, however, he has set a mark that will be used to hammer some other fellow down in price. It is these low prices of sacrifice sales that are the sledge hammers in the hands of buyers, used to keep pounding prices down and drive all the profits out of business.

Competition, as graphically illustrated by the results of investigations by the Federal Trade Commission, is a thing that does more to take profits out of business, to keep prices down and cause business failures, than anything else. It doesn't help the matter, either, to trot out that old truism that competition is the life of trade, for really it enlivens trade only to the extent it develops resourcefulness and hustling on the part of those in the trade. When it gets to the point of cutting prices, instead of putting life into trade it is beginning to sap the life of business and to do harm all around. It may help some for a man to have positive cost figures staring him in the face all the time, but even with these figures, unless we can do something to minimize competition and get the cut-throat element out of it, cost knowledge itself will not save the situation.

The third factor in the game, that of exploitation, is the one which offers the greatest measure of relief. Also, it is one that the Building Brick Bureau was created to foster and enlarge. Really there is a direct connection between exploitation and competition, two or three connections in fact. In the first place, the more we can enlarge the use of brick by exploitation the more we lessen that order of competition which leads to cutting the profits out of business.

Another thing; when those who are doing business in a given community once get together in an organized effort at exploitation, they are brought into closer touch and more friendly relations, and this in turn serves to lessen competition. They think over matters that will help, they get to comparing prices and to expressing the opinion to each other that they should not sell below certain prices; and, entirely aside from the gain directly through the exploitation itself, they are benefited through its closer touch that serves so long as they work together in a friendly way to eliminate much of the cut-throat element of competition.

That is why the Building Brick Bureau has a chance here to do a great work—a work as great in its way as has been done in connection with manufacturing methods by the National Brick Manufacturers' Association itself. The N. B. M. A. has concerned itself entirely with the welfare of the industry from a manufacturing standpoint and will continue to serve the industry well along these lines. Meantime, a need has been felt for something else, for a taking up of the commercial side, to the end that brick manufacturers may get a fair price for their product and realize the profits they should from their business. So far practically all of the great accomplishments in manufacturing methods and the work of the N. B. M. A. has been given to the world without price. To state it another way, all improvements that have served to reduce the cost of clayworking and to improve the product practically have been without profits so far as the brick manufacturers are concerned, because the trade has continued to sell its product for practically the same money and really on a closer margin of profit, so that the world at large has reaped the benefit of all this great work and but little of it has come to the manufacturers themselves.

It is time now, therefore, to get a fair price for brick. Practically everybody will agree to that. The question is how, and through what agency or method; and a part of the answer to this question has already been set forth here. Maybe we need further studying of the cost of doing business to keep properly impressed upon this, but the main need at the present time seems to be that of getting together to boost the brick selling game and to reduce the competition that results in keeping the price of brick too low. These two things really go hand in hand, and if we are to take the word of those representing the Federal Trade Commission, we are also to have the friendly co-operation of this branch of the government.

This is really a big thing that the trade has hardly realized the full meaning of yet. We still retain a strong impression of antagonism on the part of the government toward all organization and all getting together with a view to obtaining fair prices. These efforts have in the past been regarded as combinations in restraint of trade. Now the government appears to be seeing them in a new light. It has learned through investigation that we need organizations and combinations for the safety of trade to get a fair price for business, to insure the perpetuation and up-building of industry. The brick trade is in just as serious need of this as any manufacturing line in the country, and with the government taking its present stand in the matter there should be no bar in the way of community organization and general effort through co-operation to establish brick selling on a basis that will yield a fair price and a reasonable profit.

The Building Brick Bureau is the vehicle with which to accomplish this, its purpose being to act as a clearing house and to furnish the ammunition for campaign of exploitation and business building. The possibilities for good along the lines mapped out are big, stupendously big. What actually will be accomplished in the way of good for the brick manufacturing trade as a whole depends directly upon the co-operation and support of the brick manufacturers themselves.

FIREBRICK SETS NEW HIGH PRICE

The market for firebrick and refractories materials of all kind continue to strengthen and further advances in prices are expected, says the Daily Iron Trade. Larger manufacturers cannot promise deliveries in from three to four months, and no improvement in shipments likely will be noted until demand for pig iron and finished products decreases considerably.

Sellers of Pennsylvania No. 1 firebrick now are asking as high as $40 a thousand, although the $36 price has not been withdrawn by all makers. As high as $50 a thousand has been paid for immediate shipment, and manufacturers in a position to ship material abroad have no difficulty in obtaining $50 and above for silica brick. Heavy tonnages of silica brick are being shipped to England, Japan and Australia. Managers of foreign steel works appear willing to pay almost any price for brick if specifications for delivery can be met.

Despite the slow movement of freight, caused by railroad embargoes and congested traffic conditions generally, refractory brick makers have been unable to accumulate stocks of any size. Demand for firebrick is so general that most manufacturing interests have been able to move their entire output in one direction or another.

Owners of steel works find it virtually impossible to make necessary furnace repairs, on account of the scarcity of material for lining and bottoms.

CERAMIC SCHOOL AT ALFRED FORMS GUILD.

The Ceramic Guild of Alfred, has been organized in the New York State School of Clayworking and Ceramics to take care of the exhibition and sale of students' work and to encourage extra production of work toward the self-support of students.

The club is to be under the supervision of the Art Department, the details of management and the production of much of the work depending on a manager whose individual production shall form a considerable part of the work exhibited by the club.

The following ideas are some of the features of the plan: All work done as class work shall remain the property of the school until the annual exhibition of each year, after which it may be placed with the club, subject to the Art Department's approval. A percentage on each sale will go into the club treasury. Alumni and undergraduates of the Art Department may apply for membership, also craft workers of the town and vicinity, by submitting specimens of work to the jury which shall consist of five members (two chosen from outside the school) although its acceptance is not guaranteed. Persons interested in the aims of the society but not eligible as designers or craftsmen may be elected to the society.

For the present the exhibition and sales room shall be the Art Department Studio. It is planned to hold traveling exhibitions during the year and also to exhibit in the Arts and Crafts Societies of New York, Boston and Philadelphia; to that end the manager will be made a member of these societies by the club. Alumni exhibitions will be held from time to time at the school.

It is believed that by having an organization within the school corresponding to the Ceramic Society and yet complimentary to it, some things will be possible and feasible which are not so at present.

LARGE PRODUCTION OF FUEL BRIQUETS.

The production of fuel briquets in the United States in 1916 was 295,155 net tons, valued at $1,445,662, an increase compared with 1915 of 73,618 tons, or 33 per cent. in quantity, and $409,946, or 40 per cent. in value. The production in 1916 was the greatest recorded, exceeding that of 1914, the previous high record, by 44,520 tons.

This increase in the production of fuel briquets in 1916 is attributed by C. E. Lesher, of the United States Geological Survey, Department of the Interior, to the improvement in trade conditions arising from the unusual demand for coal, and to a greater general appreciation of the value of briquets for use as household fuel. During the last two years the product of many of the plants has been so much improved that it gives off less of the heavy, tarry smoke that domestic consumers have found so objectionable.

Kiln Department

THE RICHARDSON CONTINUOUS KILN.*

THE RICHARDSON KILN, as designed by Mr. W. D. Richardson, Columbus, Ohio, is the result of years of his experience in not only the operation of both continuous and periodic kilns, but a broad experience in the actual design and construction of many kinds of periodic kilns and semi-continuous kilns. His experience as president of one of the leading ceramic engineering companies in this country, the problems which it was necessary for him to meet and solve in this capacity, his long experience as an actual manager and operator of two large face brick plants, and his wholehearted interest and enthusiasm in following all developments in kilns and burning methods, all make him especially well qualified to study and produce a superior kiln.

The possible savings in a kiln burned on the continuous principles are familiar to all of you. The principal saving is in fuel; a correctly designed kiln makes possible the utilization of all the waste heat in the burned and cooling brick, and from the hot kiln walls and also the heat in the waste gases of combustion after they have heated the material to its proper temperature. From an engineering standpoint this exact saving can be calculated. Actual practice has shown that under normal conditions any ware can be burned with one-third to one-half of the fuel consumed under the same conditions in a periodic kiln.

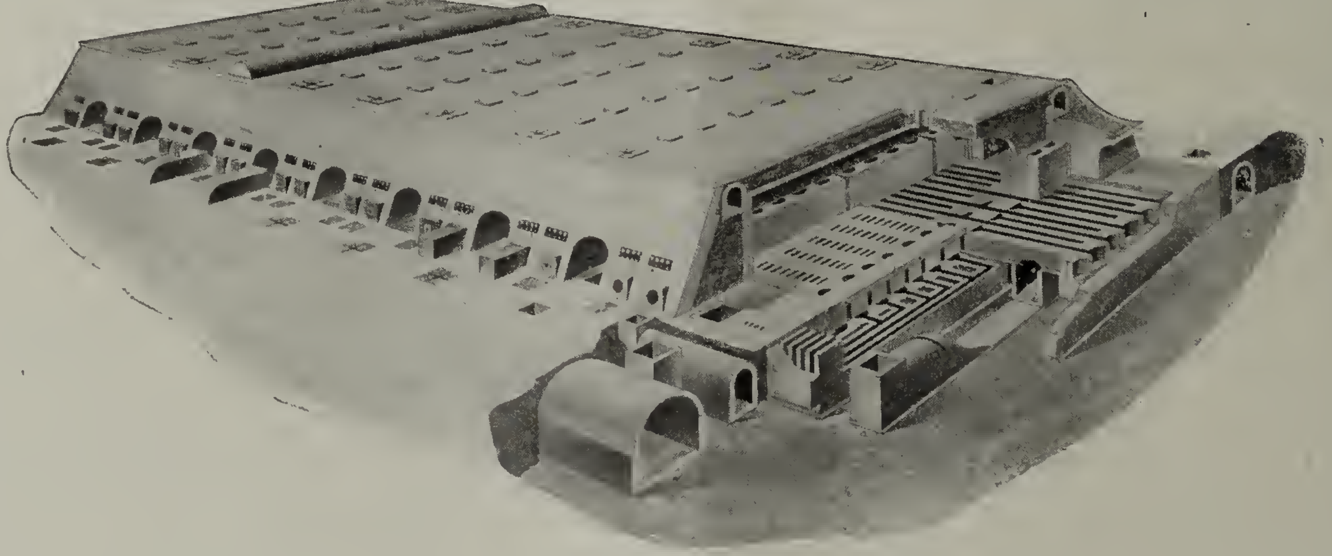

Figure 1.

The chamber kiln consists of a series of connecting chambers, combustion taking place in one and the waste gases passing into the next two or three ahead. Air used in combustion is drawn through the previously burned ware, cooling this ware and utilizing the heat in combustion in the chamber under fire. The greater number are burned with producer gas, although coal firing has been used direct.

By careful study and observation, Mr. Richardson has determined the greatest disadvantages in the chamber kilns being used at present, and his kiln is an attempt to overcome these disadvantages. His present kiln is designed for use with producer gas, although he has a kiln operated on the same principles in which he uses coal firing direct.

Producer gas firing can claim the following advantages:

(1) Clean ware.

(2) Control of oxidizing and reducing conditions in kiln.

(3) More uniform temperature.

(4) Simplification of coal and ash handling system.

The producer gas-fired chamber kilns built up to the time of the Richardson kiln had the following disadvantages:

(1) Gas ducts between the crown arches prevent a good substantial construction in the bracing of the crowns.

(2) Same gas ducts extending into the partition walls made it impossible to build a firm, solid wall between chambers, and with the expansion and construction of the chambers cracks were sure to appear in the ducts through which gas could leak before coming to its proper zone of combustion.

(3) Gas dusts uninsulated built overhead, with connections from the side where accumulated tar and pitchy deposits could find a ready exit.

(4) Air delivered under the gas, which, although hot, is heavier and intimate mixture could not be assured.

(5) Gas conducted into only one end of chamber, and burned on only one side of the chamber, giving a poor distribution of heat, low temperatures and uneven expansion of the kiln crown.

(6) Poor water smoking flues and arrangements over crowns or kilns to become out of line.

The first of these objections is overcome in the Richardson kiln by having all gas ducts for distributing the gas under the floor of the kiln. The gas from the producers is conducted along both sides of the kiln in underground brick mains of sufficient size and insulation. The gas is admitted into each chamber in four places, on both sides of the door and at both ends of the chamber. (See filst illustration.) At this point the gas enters a receiving chamber from where it enters distributing flues. The gas is brought into these chambers from the gas mains by hoods, and distributed to the combustion chambers through ducts having their outlet from these receiving chambers controlled by valves. (See Figure No. 2 and No. 3.) The ducts lead to each bag wall, one duct on the first and two on each succeeding bag.

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*A paper by H. C. Arnold of the Ceramic Department, University of Illinois, read before the last Illinois Clay Manufacturers' Association Convention.

This arrangement of gas distribution also eliminates the second objection—hollow partition walls. Each wall is solidly built from the floor up. There are some small openings in the lower part for air distribution, but other than these the whole wall is solid.

The ducts along the side of the kiln produce complete insulation and prevent excess radiation, which was the fourth disadvantage. (See No. 2.) The valve control is all from one side, one valve to each duct and wires leading across the top of the kiln to the other valve. By sighting through a single peep-hole and noting the flame, one side of the kiln can be controlled. The other peep-hole on the other side of the wicket controls the other flame.

The advantage of burning on both sides of the chamber, and from diagonally situated bag walls, cannot be overestimated. The possibilities of heat distribution are equal to the standard periodic kiln; large chambers are possible, almost double the capacity of the one side fitting. The uniform expansion of walls and crowns, where one side firing is used. The walls on that side of the chamber and the whole crown gradually draw in toward the fire. This leaning wall and deflected arch push the other side of the crown up, and the wall becomes entirely out of plumb. The attainable temperatures are much higher with the normal sized chamber, or if only a normal temperature is required, this advantage can be applied by increasing the size of the chamber.

Probably the most unique part of the design is the method of air distribution, so that preheated air can be conducted from one chamber into the next, half of the air passing up one side of the burning chamber and the other half passing under the floor to the opposite side of the chamber and coming up through the bag walls on this side.

The main draft flue passes along the side of the kiln to the fan, where all the heat possible has been withdrawn from the products of combustion, a breeching connects the draft collecting flue (one under each chamber) to the main draft flue. The bags are papered up in the usual manner and the air withdrawn from that chamber.

Immediately above the gas flues are the air ducts. Each duct is complete in two chambers, but the neighboring ducts do not begin and end in the same two chambers. Alternate ducts do. The beginning of one duct is in the chamber where its neighbor ends, the next begins, and the next ends, etc. The duct which begins in a certain chamber is an open duct; that is, the floor brick are the kiln-lug brick. On entering the next chamber this duct becomes a close flue, solid brick flooring, ends in the farthest bag wall and has an opening in the nearest. This duct, in the chamber where it begins, because of the suction from the kiln before it, draws up the air, passes it through the wall into the next chamber, and here it emerges in the two bags. If this is the chamber under fire the gas from the producers are just below this entering air, come up through the air, thus forming an intimate mixture, and igniting.

For clays which give trouble in water-smoking with combustion gases, a double water-smoking flue is installed at top and side of the kiln. The air is drawn through the top of last cooling chamber into long sheet iron movable collectors on the top of the chamber to there flues at the side. (See No. 1.) Here it is conducted to a second sheet iron collector, passes from the collector by means of openings in the roof, drawn through the ware which is being water-smoked, through the floor and out into the main draft flue by means of the breeching and the gas collecting flue. The flues are at the side, away from the rise and fall of the crown, and the tendency to get out of line and well insulated.

The kiln is connected to the producer by a soot chamber in which most of the soot is deposited before the gas enters the gas flues along the sides of the kiln. The construction is similar to the ordinary soot chamber, the gas passing through the chamber down the side into the ducts. Its connection to the kiln and the connection of the producers is shown in Figure No. 5. This chamber eliminates cleaning out of flues to a large extent.

The producer used is designed by Mr. Richardson also. It is restricted entirely to use on brick plants, being very simple and designed only to meet the continuous kiln conditions. Figure No. 6 is a section through the producer, showing the brick structure and bracing the coal holes, cleanout doors, water-jackets, tuyers and water basin. A gas producer used in brick and tile plants must be high enough to furnish

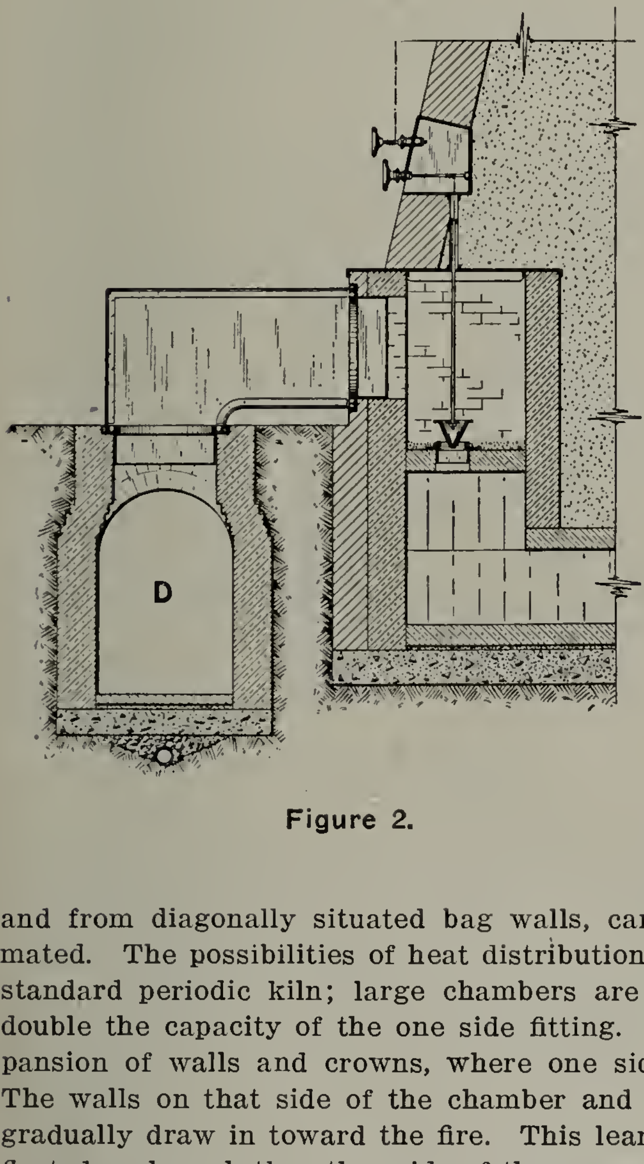

Figure 2.

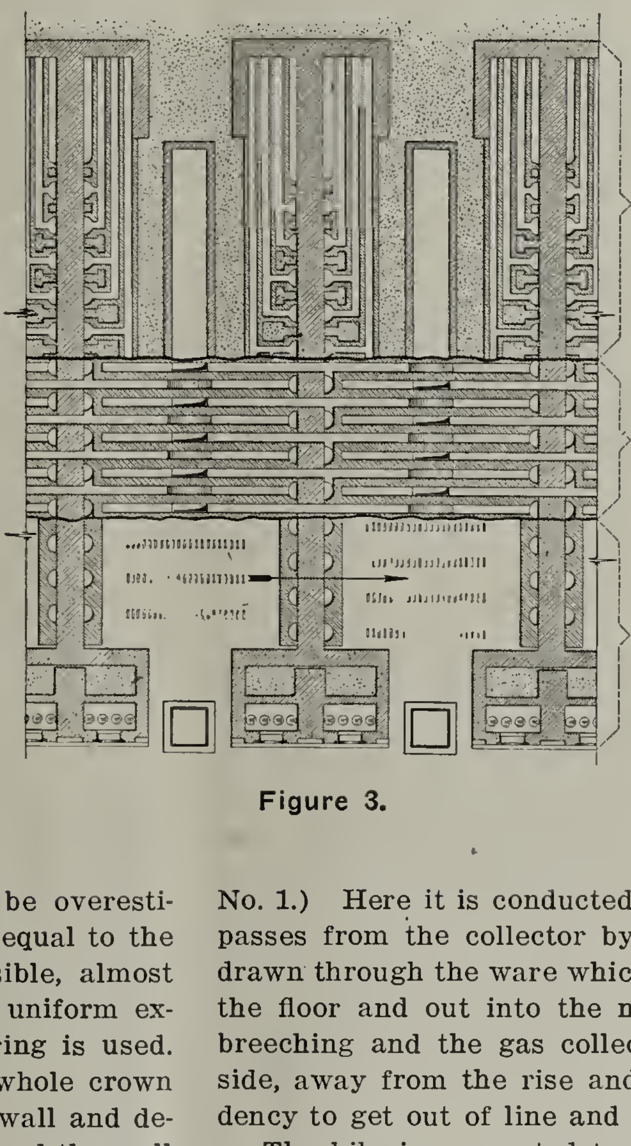

Figure 3.

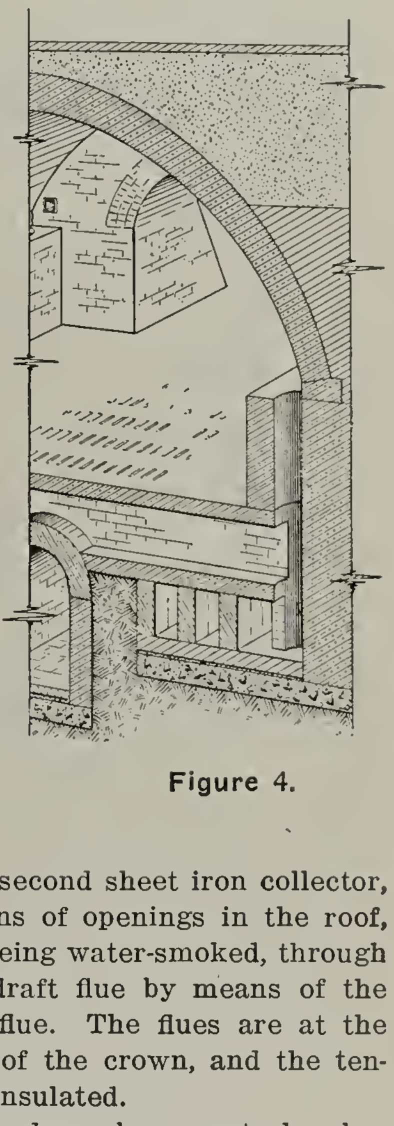

Figure 4.

proper depth of fuel, have a coal feeding hopper, a tuyere with blower, a water-basin at bottom with seal, means of cooling producer combines all these points, and only these; so that its construction is simple, its operation easy and its first cost very low as compared to other installations.

Two kilns are in operation in this country, and at present one is being built in Australia. The kiln at Hebron, D. D., has been in operation for two or three years and is giving every satisfaction. As to its action in comparison with other kilns, Mr. Richardson reports:

"We burned to cone 6, about 8 inches from the bottom of the kiln, and have got this cone in the bottom in 24 hours from the time of turning the gas on the chamber; have frequently done this in 36 hours, although we allowed 48 hours for the burning, as we could not set or empty a chamber in less than two days. In our periodic kilns at Hebron, rectangular downdraft, 60 feet long inside, with lignite coal, we can only reach a temperature of cone 3 in seven to ten days by consumption of coal is more than twice as much."

He also says, "An interesting feature of the kiln is the ease with which any chamber can be flashed; strong reduction in the chamber under fire and oxidizing fire in chamber ahead. We burn the gas in the chamber ahead of the one being reduced by taking off the covers from the gas receiving and distributing chambers or valve boxes, and regulating the amount of air by means of the gas valves. It works fine."

The second kiln, built by the Ludowici-Celadon Company, New Lexington, Ohio, is a 16-chamber roofing tile kiln. Eight chambers were completed and put in operation about August 1st. I have no exact figures as to the action of this kiln, but I do know that the kiln being built in Australia was sold entirely on the recommendation and action of the New Lexington kiln. Contrary to their usual custom, the Ludowici people took the Australian representative into their plant and showed every detail of their operation. His decision depended upon the results they obtained on their first burn around. The kiln not only met their greatest expectation, but ran about 20 per cent better.

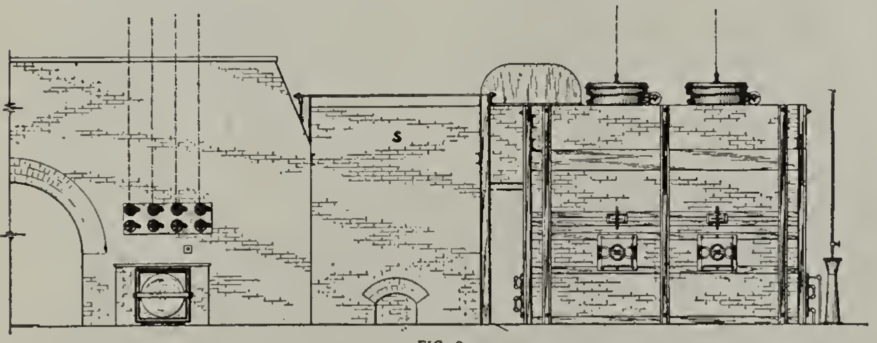

FIG. 3.

Figure 5.

In this connection it is interesting to know that after installing an immense expensive mechanical producer, at an enormous cost, this company was forced to abandon this producer as unsatisfactory, and have since installed three simple, economical Richardson producers.

The kiln in Australia is just being built; it is to be a 12-chamber kiln for burning roofing tile. It is being erected by Evans Brothers at Sydney.

WHO WROTE THIS ROAD PAEAN.

"Roads rule the world—not kings nor congresses, not courts nor constables, not ships nor soldiers. The road is the only royal line in a democracy, the only legislature that never changes, the only court that never sleeps, the only army that never quits, the first aid to the redemption of any nation, the exodus from stagnation in any society, the call from savagery in any tribe, the high priest of prosperity, after the order of Melchisedech, without beginnings of days or end of life. The road is umpire in every war, and when the new map is made, it simply pushes on its great campaign of help, hope, brotherhood, efficiency and peace."

This praise of roads is being printed rather widely now, but nobody seems to know the author. Many inquiries as to who wrote it have been received by the American Highway Association and if anybody knows he will confer a favor on many inquisitive road builders by sending the information to the Washington office of that organization.

Written for The Clay-Worker.

MILWAUKEE AND WISCONSIN BRICK NEWS.

WITH THE European nations shooting potential bridges and skyscrapers at one another in the form of high-power projectiles, and the United States itself getting ready to apply its steel product in defense of its national and international rights, that building product called brick, which has stepped into the dearth of building materials as a genuine reinforcement to the building element of America, may well laugh in the assurance that its popularity has only begun throughout the entire country, particularly in Wisconsin.

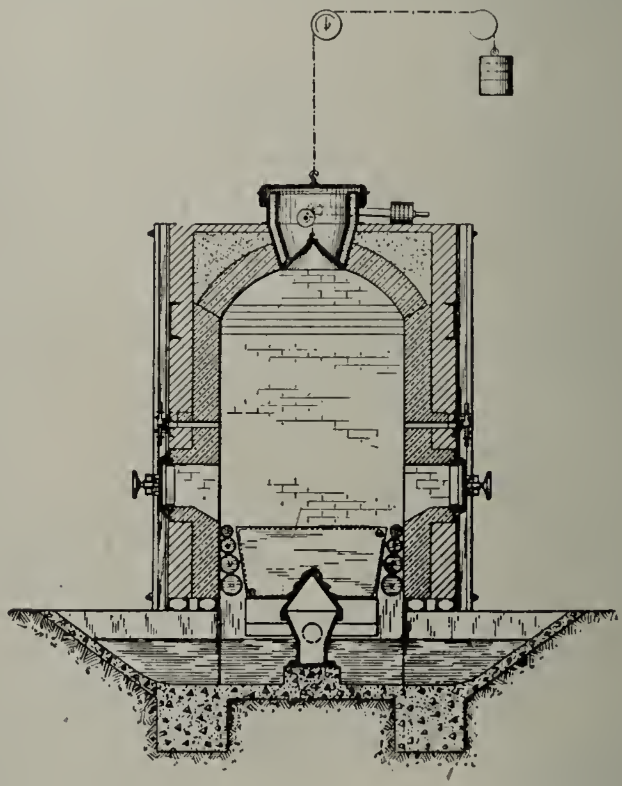

Figure 6.

The Badger state, to judge from the preponderance of brick as the choice for the material to be used in the buildings both under the pens of the draftsmen and under actual construction, may justifiably have the epithet of "brick state" hurled at it when the building season of 1917 pulls aside its barricades and building boxes to reveal its brick villages and cities.

Leaders in the brick business in Milwaukee, who are in constant association with contractors and architects of the entire state, attribute the boom of brick to two sound economic causes, omitting, of course, the obvious scarcity of many other materials. The causes are: the predominant efficiency of brick as an all-around construction material and its very modest price. It will endure strains and surface wear that would practically shred and shave the best of lumber. And then there is the big point: brick is cheap because the only factor to which its producers have been forced to consider in the adjustment of price is labor.

War carried on to the tooting of Gabriel can not place into the field another factor to increase the cost of brick, unless it be a decree that all soldiers in the trenches shall smoke clay pipes.

The White Rock Quarry Co., Baraboo, Wis., has contracted to furnish 2,000,000 paving brick. The work at its plant is beginning to assume a real hum of speed.

The Manitowoc Clay Products Co., Manitowoc., Wis., is furnishing the brick for the big addition to the Reformed Church Mission House College in Franklin, Sheboygan county, Wis.

Drainage engineers, manufacturers of tile, ditching implements and machinery recently met in Madison, Wis., to discuss Wisconsin's vast acreage of soggy, useless lands and to confer on practicable reclamation processes.

Tile produced in Whitewater, Wis., was recently declared to be the best of a large exhibit of variety by Professor Jones, of the University of Wisconsin.

Ricketson & Schwarz, Milwaukee, Wis., furnished the brick for the new Plankinton Hotel, recently opened at West Water and Sycamore, Sts., Milwaukee. In a big supplement to an issue of the daily Sentinel, following the opening, the Ricketson & Schwarz Co. announced that fact in its usual way—a cut of a brick with the words "Who furnished the Brick? Ricketson & Schwarz."

The Acme Brick Co., Barton, Wis., has added considerably to its machinery equipment to facilitate the increased production demanded by a growing order file.

The Burlington Brick & Tile Co., Burlington, Wis., recently made its first shipment. It was a carload lot of tile consigned to Wind Lake, Wis., via the Burlington interurban electric.

At the annual meeting of the Adams Patent Wheel Co., Cassville, it was decided to reincorporate for the purpose of adding a pottery products department to its plant.

The case of the Builders Lumber & Supply Co., of Wausau, Wis. vs. the Chicago Bonding & Surety Co., was decided in favor of the plaintiff in a recent opinion filed by Judge A. H. Reid.

The defendant company executed bond to the city guaranteeing the completion of the paving of portions of Forest St. and Grand Ave. by the Condusive Paving Co. The plaintiff furnished a large quantity of paving brick, lumber and cement, for which it received only proportionately small payments. After work had been suspended in November, 1916, the plaintiff sued the bonding company, which demurred on the point that the bond protected only the city and not contracts for labor and supply. According to the ruling of Judge Reid, the Builders Lumber & Supply Co. will recover for all the materials furnished, either from the contractors, or, as a surety, from the bonding company.

Ricketson & Schwarz, 111 Mason St., Milwaukee, Wis., furnished the brick, all of the standard Fiske-Tapestry quality, for the new Citizens' National Bank Bldg., corner Washington and Cherry Sts., Green Bay, Wis. The feature of the new building is the absolutely daylight idea of natural illumination during banking hours.

The engine rooms of both the Bertler Brick yards and the Manitowoc Clay Co., Manitowoc, Wis., were recently looted by metal thieves who carried off brass valves and other articles valued altogether at about $150. Despite the vigilance of the police following the transpiration of junk-disposing activities in this city, the practice of machine room thievery continues.

A. BADGER.

A UNIQUE ROAD MODEL.

The relocation of the old roads seems to be something mysterious or uncanny to so many taxpayers that the Pennsylvania Highway Department has had an unusual model made to show just how such work betters traveling conditions. This model measures six by five feet, and was made by a specialist in such work, at Washington. It is in relief, with roads, fields, houses, trees and other features of the landscape reproduced to a correct scale. On it are shown three types of poorly located roads frequently found, and the proper method of relocating each so as to provide satisfactory grades and connect terminal points in the most direct manner. The model also shows three types of road construction, water-bound macadam, bituminous concrete and cement concrete. with bridges and culverts of standard types. This model is being shown at county fairs and has attracted unusual attention, so it may be considered a decided successful educational exhibit which other state highway departments may find it desirable to duplicate.

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

The MONTH OF MARCH saw building permits to the total of $1,922,391 issued in San Francisco, as compared with a $2,512,228 total for the same month in 1916. Despite this, the number of permits was greater this year than last and the big difference in the amounts involved is to be found in the fact that no very big jobs are projected at this time. One of the largest jobs announced during March was the armory to be erected on the University of California campus at Berkeley. This is to cost in the neighborhood of $150,000. City and county work to a total of $1,500,000 is planned and this will cause considerable future activity. This latter work includes the erection of twelve elementary schools and one high school and repairs to a number of existing buildings. The biggest factor in Pacific Coast trade has been the number of good homes being erected, which is reaffected in the orders for terra cotta and fancy tiling. This year has seen an especially permanent type of beach and mountain houses built in this state. Rustic and brick combined seem the popular building combination for these summer homes.

The Building Materials Exhibit is constantly becoming more and more of a factor in local business circles. A large number of brick and terra cotta concerns now have displays there.

The Hotel Whitcomb, San Francisco's newest and finest hotel, was opened the first week in April. More than one million dollars was spent in fitting up this building, which was used as a temporary city hall for several years, and it is without a question the best example of its type to be found. The hollow floor tiling used in the kitchen on the first floor and in the storeroom, bakery, butcher shop and storerooms in the basement were furnished by the Richmond Pressed Brick Co.

Recent contract awards include that for 170,000 brick delivered at the Board of Public Works yard at $25 per thousand, to the California Brick Co.; the award for furnishing the brickwork and hollow tiling for the new Fairmont school building to A. W. Lawson for $10,889; several large contracts at private figures calling for polychrome terra cotta for use in new Oakland buildings to the Livermore Fire Brick Co., and three contracts for Los Angeles buildings which went to the Alberhill Clay Works.

After the ninth of this April, a special freight rate is established on terra cotta roofing tile between the Pacific Coast and Atlantic Coast terminals. The new price of 75 cents on a minimum of 50,000 pounds will enable coast manufacturers to compete in the Eastern markets.

Arthur S. Cunningham, vice-president and general manager of the recently organized California Clay Corporation, of Ione, Cal., accompanied by Mrs. Cunningham and their sons, has gone East. He will be away several weeks while Mr. Cunningham's family plans to make a more extended visit.

Harry Leon Wilson, of "Bunker Bean" and "Ruggles" fame, has decided to put some of the profits of authorship into real business and recently purchased a large block of stock in the Monterey Potteries, at Monterey, Cal.

A pottery plant is to be established at Gonzales, Monterey county, Cal., subscriptions having reached a total large enough to warrant starting the main building. This will be 90x230 feet and will be devoted to the manufacture of white enamel sanitary ware.

The Needles Brick & Tile Co. has been organized by Earl Hodge and Anthony Beimer and a plant having a capacity of 50,000 brick daily will be erected at Needles. Several large contracts have already been received.

The Richmond Pressed Brick Co. is at present receiving 150 tons of kaolin from the Dempsey ranch at Smartville, Yuba county, and is also getting regularly rail shipments of a new type of porcelain clay from Calistoga, Cal.

The Livermore brick factories are both running with full forces and have so many orders on hand that ninety days delivery is all that they can offer. The Livermore Fire Brick Co. plans to increase its dryer capacity shortly while the Coast Manufacturing & Supply Co. is now employing more than two hundred men in its brick yard.

D. W. Morris has been elected president of the Union Brick & Tile Co., of Modesto, Cal.; N. E. Leek, vice-president; W. A. Downer, treasurer, and George T. McCabe, secretary. D. M. McLean and George A. Threfall were chosen as directors.

F. O. McGill and L. D. Sharp, of Fairfield, Idaho, are to establish a plant at Gooding in the same state for making fire brick.

The Union Brick & Tile Co., of Modesto, Cal., is to reopen next week, after having been closed for the winter. A siding of the Tidewater Southern Railroad has been extended to the plant, and $20,000 will be expended in new machinery to increase the plant's capacity. A. B. Klay is to have charge of the plant.

Salt Lake City is shortly to expend $400,000 for the purchase and installation of vitrified sewer pipe in the Third ward of that city. Half of this sum will be raised by special tax and the remainder through a bond issue.

The Coeur d'Alene Clay Company, Spokane, Wash., is to resume the manufacture of fire brick at its Atlas and Huetter, Washington, plants. New officers were recently chosen for this year as follows: Oscar Nelson, president; H. H. Barton, secretary; Edward S. Smith, vice-president, and Jacob Jessen, treasurer. The board of directors, besides the officers, is made up of J. H. Kirk, C. K. Lithe and Frank Post. It is planned to increase the capital stock of this company to $100,000 shortly.

The Los Angeles, Cal., Builders Exchange held its primary election last month. James H. Bean was chosen president, there being no other candidate for his office. W. R. Simons, of the Simons Brick Co., is one of the candidates for first vice-president. Simons and H. B. Potter were nominated to represent the brick and burned clay products crafts on the board of directors; W. E. Stardley was nominated by the brick and mason contractors, and Frank Peck by the sand and gravel contractors.

San Francisco, Cal. SUNSET.

COMPARATIVE STATEMENT OF BUILDING OPERATIONS FOR MARCH.

Building operations throughout the country are satisfactory in volume from a rational viewpoint. The general impression among architects and contractors is that business is quiet; prospective work may not be specially insistent at this time. But the statistics show that, as compared with a year ago, there is only a moderate decline. February showed a decrease of 5 per cent., as compared with February last year. The March figures show the same shrinkage, as compared with March, 1916. But the totals for last month are over 50 per cent. greater than for February, which is the normal trend, as the active building season approaches.

Building permits, issued in 111 principal cities of the United States during March, as officially reported to the American Contractor, Chicago, total $79,284,262, as compared with $83,624,502 for March, 1916. The total number of building permits issued was 23,406, compared with 25,264 for March last year.

It is noteworthy that a greater number of cities show gains than losses, 63 increasing over a year ago and 46 decreasing, two holding stationary. The larger cities make the more unfavorable showing, which is no doubt explainable by the fact that in these cities a larger percentage of the buildings are of steel construction and that because of the great scarcity it is almost impossible to obtain structural shapes. New York shows a comparative loss of 20 per cent.; Philadelphia, 24 per cent.; Boston and vicinity, 30 per cent.; St. Louis, 27 per cent.; Pittsburgh, 31 per cent. Chicago neither gains nor loses.

OREGON CLAYWORKERS MEETING.

ONE of the most successful meetings ever held among Pacific Coast clayworkers was the third annual meeting of the Oregon Clayworkers Association, held in Eugene, March 15 and 16, 1917. Due to the untiring efforts of President Harold S. Smith and Secretary S. Geijsbeek, a large attendance turned out.

The business session was very spirited at times, and the work accomplished shows that the Oregon clayworkers are a unit and good results are obtained. The meeting went on record as pledging support to President Wilson, and a telegram was sent him to that effect. Among the various matters voted on, was an expression in favor of the state bond issue for good roads; to hold the summer meeting in Portland, and to make a trip to the Puget Sound and visit various clay plants there; to issue a monthly news letter among the members; to assist the State Drainage Association in its work of creating drainage districts; to call a meeting of all operating play manufacturers in the state to consider a raise in price of all clay products.

The following officers were elected for the ensuing year: Mr. L. E. Kern, Kern Brick Co., of Portland, president; Mr. W. C. Corbett, Corvallis Brick & Tile Co., of Corvallis, vice president; Samuel Geijsbeek, of Portland, was re-elected secretary and treasurer. Mr. T. S. Mann, of the Pacific Stoneware Co., Portland, was re-elected a director for two years.

The first day of the meeting was spent in visiting the University of Oregon, where Prof. Dr. Warren Smith gave a lecture, illustrated with lantern slides, about clay formations, and also showed a series of lantern slides of a European porcelain pottery. An informal dinner was tendered the members by the officers of the Fairmount Brick & Tile Co. in the evening.

Mr. W. E. Wilson, of the Salem Tile & Mercantile Co., of Salem, presented a paper, "Clay Products for Farmers' Use," giving the details of how pleased farmers are with the use of drain and hollow tile on the farm. Also that clay tile for silos are better for the Pacific Coast section than any other material.

Prof. H. M. Parks, Director of the State Bureau of Mines, gave an interesting talk about the doing of the bureau and asked for information as to what extent the bureau could assist the clayworkers. He was told that an investigation of the fuel question would be very much desired.

Mr. T. S. Mann, Portland, urged the co-operation among the members not only in good fellowship, but also in making trade and promoting sales.

Mr. S. Geijsbeek, of the Geijsbeek Engineering Co., of Portland, gave a very interesting talk about his observation among clay plants while east last year, and showed that the clay plants on the Pacific coast, while smaller in size than those of our eastern friends, were just as up-to-date as any eastern palnt.

Mr. O. K. Edwards, of the Pacific Face Brick Co., of Portland, gave a detailed talk about the cost of clay manufacturing as practiced at his plants, and stated that the systems put in by accountants was too cumbersome for every-day use. He had worked out a more simple method and obtained better results.

Several outside clayworkers were present at the meeting, and Mr. B. L. Tracy, of the Arago Brick & Tile Co., of Arago, and Mr. W. L. Mason, of the Oregon Brick & Tile Co., of Beaverston, were elected new members of the Association.

THE MOTHER OF MODERN CERAMICS.

THE potter and his clay have left their mark, and show no weariness in good works. The woman in the picture practices today high arts of symmetry and skill, unconscious that other women worked in the self-same way so long ago that their broken water jars lie mingled in the lowest strata over which archaeologists puzzle with distracting learning. She is unaware that she really belongs before the age of mythology, when all the world agreed so beneficent a tool as the potter's wheel—to which she has not attained—could only come directly from heaven, and she would scoff at the idea that her piece of earthenware is the precursor of the translucent porcelains of China which made our Middle Ages gasp with astonishment and joy and set the alchemist at work to discover the secret of a thing quite as precious as gold, the Sevres vases which royalty delighted to fashion, and a modern industry so important that an American university in December opened a three-story building devoted to its technique. In a modern china shop the woman in the picture would be so frightened she would cause about as much havoc as the traditional bull, and yet she has made the china shop possible.—The Nation's Business.

Courtesy of The Nation's Business

Primitive Method of Making Pottery That Still Prevails in the Old World

CLAYWARE FROM JAPAN.

ATTENTION HAS been called before to the growing menace of clayware importations from Japan. They are constantly growing and obviously every cargo, or part of a cargo, that comes from there means that something of a similar character made in our own yards and potteries cannot be sold. Altruism may be acceptable as an abstract doctrine, but it would be more profitable to American manufacturers if they controlled their own markets.

Here are some figures in a recent report which are interesting. This country imported from Japan in 1916 clay products of various sorts aggregating $1,636,562; in 1915, $1,188,161; in 1914, $1,311,916; in 1913, $1,342,479.

It will be noted that the imports in 1916 jumped about a half million dollars, though they ran along about the same for a number of years previously. It may be assumed, too, that these imports will increase very rapidly this year since a great many American buyers, shut out of the markets of Europe, have visited Japan this season. What they did will not appear until deliveries begin, but judging from their own deports they undoubtedly made liberal purchases in a good many different lines, and presumably in this one too.

The situation is one which clayworkers and manufacturers will do well to consider. It may mean something of importance to them in the future. The one hopeful factor in the situation is that labor costs on all Japanese manufactures have advanced as a result of the war and are now at the highest point ever known. This is some benefit and may be the solution of the problem of Japanese competition in the clayworking industries.

NEW PLANT OF THE PHILADELPHIA TEXTILE MACHINERY COMPANY.

THE Philadelphia Textile Machinery Company, Philadelphia, Pa., has just completed the erection of a new plant, a photograph of which we take pleasure in publishing herewith. Modern in every detail, the new factory is equipped with all known devices for the safety and convenience of the workmen and for the promotion of working conditions, which will result in the greatest accuracy in the manufacture by the company of its well-known "Proctor" dryers.

The location of the new plant is excellent. It is on very high ground, in a section of the city where the most healthful conditions prevail, and the workmen will be surrounded by all the necessary elements to good health; namely, fresh air, light and sunshine.

The factory building proper is of the saw-tooth construction. It is one story in height and all the sides are of glass. The saw-tooth construction and glass sides insure plenty of good, natural daylight distributed in such a way that there are no shadows in any part of the building. The entire interior of the building has been painted white in order to make it still more bright and cheerful. The floor of the factory is made of hexagon wooden blocks.

Bird's-eye View of the New Plant of the Philadelphia Textile Machinery Company

A railroad siding which runs inside the building for its full length permits the loading and unloading of machinery indoors without exposing the men or machinery to the weather.

The building has a very large area, all on one floor, and all under one roof. Every detail of this building was designed with the idea in mind of making it the very best possible for the manufacture of the firm's particular class of machinery. The materials are moved systematically from the time they are received on the freight cars in their raw state until they are again loaded on the freight cars in the finished machines.

Although the Proctor dryers have gained fame in several fields of operation during the past decade or more, the company feels that this new factory with all its conveniences and excellent equipment will enable them to produce more and better drying apparatus in the future than they have in the past. It is only of recent years that they have been giving particular attention to drying clays and clay products, but the success attained in this line of trade has been marked. A number of large brick and tile plants have installed Proctor dryers with decided benefits. Those contemplating the erection of up-to-date plants or the improvement of old ones should investigate the Proctor dryer. For further particulars, see their ad on page 462 of this issue, or better still, get their catalogue and ask for specifications for the particular purpose for which a dryer is desired.

MAGNESIOFERRITE—ARTIFICIAL AUSTRIAN MAGNESITE.

Austrian magnesite has been generally conceded as unsurpassed for refractory purposes in steel metallurgy, and no other deposits have thus far been found which seem to possess the same physical or even chemical characteristics. Its loss to the American steel industry because of the war has been a serious one involving many difficulties in securing a proper material, either as brick or otherwise, for furnace linings. After calcining it is said to contain about 5 to 10 per cent. of oxide of iron which seems to bestow some of the unusual properties on it. Some call it a magnesioferrite ore.

Attempts to reproduce or imitate this natural compound have been many. A process has been patented by C. B. Stowe, Stowe & Fuller Company, Cleveland, Ohio, for making this mineral synthetically from natural magnesite practically free from iron. Rolling mill scale or iron ore is added to this together with enough water to give it the consistency of mud. This is then molded and baked until it is hard enough to be capable of stacking in a kiln, where it is baked to dry off the carbonic acid gas and water, causing the iron to unite with the magnesia. The temperature employed is between the melting points of Nos. 11 and 18 Seger cones and it is maintained for from 36 to 48 hours. One burning does not complete the process, two and even three being necessary before proper brick result. Before each burning the material is broken up and ground; when crushed it is suitable as grain bulk for linings of openhearth or electric furnaces after the first baking, according to the claims.—Iron Age.

It is much better to have a reputation for enterprise than for cheapness.

QUESTIONS OF INTEREST TO CLAYWORKERS

ANSWERED BY J. J. KOCH.

Question: Will you inform us as to the kindling temperature of coal?

Answer: What is probably meant is the "ignition" temperature. The following statements are taken from "R. S. Hale's Report on Efficiency of Combustion," which gives a very concise resume of the varying conditions, when using bituminous coal. For a beginning it refers to the temperatures at which some of the physical and chemical changes take place, when a fresh charge of coal is thrown on a fire. They are about as follows:

(a) Previous to putting on a charge of coal the temperature of the bed of coals is from dull red heat (700 deg. C. or 1292 deg. F.) up to a bright white heat (1400 deg. C. or 2552 deg. F.), or even higher.

(b) The coal when fired is about 15 deg. C. or 60 deg. F. (temperature of the room). As soon as it reaches the fire bed it begins to heat by conduction, from the hot coals beneath. The hot gases, products of combustion of the coal beneath, also heat the new charge of coal.

(c) The heating of the coal causes the volatile matter to distill off. The amount distilled at any given temperature is unknown, but it is certain that traces of volatile combustible matters are given off as low as 110 deg. C. (220 deg. F.)

(d) At about 400 deg. C. or 750 deg. F. the coal reaches the temperature of ignition and burns to carbon dioxide (CO_2).

(e) At about 600 deg. C. or 1100 deg. F. most of the gases given off by coal (hydrogen-marsh gas and other volatile hydrocarbons) will ignite if oxygen be present.

(f) At 800 deg. C. (1470 deg. F.) the carbon dioxide, as soon as formed from the coal, will give up one atom of its oxygen to burn more coal. Thus: $CO_2+C=2CO$ (carbonic oxide). This carbonic oxide will burn back to carbon dioxide if mixed with oxygent at the necessary temperature, which is between 650 deg. and 730 deg. C. (1200 deg. and 1350 deg. F.)

(g) At about 1000 deg. C. or 1832 deg. F. the H_2O (water in vapor) formed by the burning of the hydrogen in the volatile matter in the coal, begins to dissociate.

(h) At about 1000 deg. C. or 1832 deg. F. any carbon dioxide not previously burned to carbonic oxide begins to dissociate to carbonic oxide and oxygen.

(i) The various hydrocarbons, which begin to be distilled at 110 deg. C. and possibly lower, undergo many changes, dissociations and breakings up at the various temperatures they pass through. So many of these are unknown that it is useless to state the few we do know.

Above 700 deg. C. (1300 deg. F.) both the hydrocarbons and the carbonic oxide will unite with oxygen if the latter be present and intimately mixed with them. If they do not burn, the tendency is always to break up into simpler and more volatile compounds as the temperature rises.

The above statements, however, give only the properties of the coal and the chemical reactions it is capable of at the different temperatures it passes through. Its actual combustion depends upon the supply of oxygen, as well as on the condition of the coal at any given time. The oxygen is practically all supplied from the air, the amount of oxygen present in the coal being so small as to be of no present importance, even if it is not already in chemical combination with the carbon and hydrogen.

The combustion of carbon (C) proceeds about as follows: The air entering through the hot grate bars becomes heated, and its oxygen unites with the incandescent carbon, forming carbon dioxide, thereby producing heat, which keeps the layer next to the grate in an incandescent condition (state). This carbon dioxide at a high temperature then has to pass upward through the layer of solid carbonaceous matter above (functions of a gas producer), and it takes up an additional portion of carbon, forming two particles of carbon monoxide ($CO_2+C=2CO$).

In this operation heat is absorbed, and there is also lost an extra portion of carbon, unless the monoxide meets with more oxygen to complete its combustion.

There is another peculiarity of this carbon monoxide, namely, that it will inflame at a lower temperature than the coal gases (CH_4 and C_2H_4), due to its having already united with half its full capacity for oxygen. Consequently when the oxide has passed into the flues, and has come into contact with the cool brick surfaces in the kiln, its temperature is often reduced below that required to burn the coal gases, but is still hot enough to take up its extra portion of oxygen, which it frequently does on reaching the top of the chimney, where it becomes ignited on meeting the air. This explains the red flame so often seen at top of chimneys, and necessarily the heat there generated is entirely lost for some purposes of brick kilns.

While on the subject of combustion it will be well to recall the laws of Avogadro (1811), which may be expressed thus: "The molecules of all gases, simple or compound, occupy equal volumes, or, equal volumes of all gases contain under similar conditions of temperature and pressure the same number of molecules." "The molecules of compound bodies in a gaseous state, with but few exceptions, occupy twice the volume of an atom of hydrogen." From this reasoning, the volume of CO is equal to twice the volume of CO_2 producing it. That is, when a particle of carbon burns into CO_2 and then meets another particle of carbon, the volume of the monoxide formed will be twice the volume of the original dioxide. This fact accounts for the loss in available heat.

Furthermore, the production of carbon monoxide will require the same volume as if the carbon were burned to the dioxide, and, while equally filling the flues and choking the draft, will only generate about one-third the heat.

This conclusively shows that good kiln construction must not have alone adequate area, but also sufficient pulling power, to accomplish satisfactory results.

Mallard and Chatelier made some experiments, in which mixtures of hydrogen and oxygen, carbon monoxide and oxygen, and marsh gas and oxygen were placed in a closed chamber, which was heated externally. They found that the hydrogen and oxygen ignited at 555 deg. C., the carbon monoxide and oxygen at 655 deg. C. and the marsh gas at 650 deg. C.

The results were found to be independent of the proportions of the gas in the mixture. It was also found that the presence of an inert gas, such as nitrogen, did not alter results, with the exception that a large amount of carbon dioxide in the mixture of carbon monoxide and oxygen elevated the ignition temperature from 655 deg. C. to 700 deg. C.

With the hydrogen and carbon monoxide mixed with the oxygen, the combustion ensued immediately on exposure to the temperature of ignition, whereas with the marsh gas there was a lag in the ignition, time being required to ignite the gas after it was brought to the temperature of ignition.

In the combustion of all hydrocarbons there is the additional feature of splitting up into hydrogen and carbon, which takes time and consumes heat, as against the rapid subsequent burning of the hydrogen and carbon. This statement shows that it may not be profitable to use a coal high in volatile matter, unless provision is made for the volume required and allowance made for its possible ignition lag.

THE CERAMIST'S CORNER

This is a department which appears in The Clay-Worker from time to time dealing with practical and technical matters of especial interest to the ceramist. This month we give in full a paper which appeared in the transactions of the American Ceramic Society, Volume XVIII.

PRACTICAL HINTS ON THE BURNING OF SALT GLAZED VITRIFIED HOLLOW WARE.*

S. C. Karzen.

DEFECTS in sewer pipe are quite numerous, and appear at the most unexpected times, but all the troubles can be traced back to some definite cause, and if each of these causes be eliminated, most assuredly the troubles will disappear.

The most common trouble encountered in burning is the so-called blowing or scaling. This is done during the water smoking period and as we are all aware by lengthening the period, this defect may be eliminated. Although this knowledge is quite common among clayworkers, it is really surprising how few of them know how to proceed when the trouble shows up.

It is for the unknowing ones that the following chart has been drawn up. It is self-explanatory, and can be used with any type of clay, and I am quite sure that if a little judgment is used along with the chart, good results may be obtained.

As may be noted in Table I, the burning period is divided into days, the length of the period depending on the size of the largest ware set. Ware manufactured of shale ordinarily takes longer periods of burning, due to excessive amount of carbon present. Fireclay ware requires shorter periods as noted. A series of cut and dry methods must be used to determine the conditions of different plants. For example, we set a kiln of 18 in. D. S. pipe and mark the burn nine days as per Table I. The burning method as outlined on the chart for a nine-day kiln is then followed. We find that the ware is all right when drawn. The next kiln of ware (18 in. D. S.) we set, we mark up 8 days and follow the schedule for an 8-day kiln. When the kiln is drawn the ware is noted, and this method is followed until we see that if we cut the time any further trouble will result, and at this point it is wise to stop.

Using this method of burning, it is readily seen that a close tab can be kept on ignorant burners. Also placing burners on a time schedule for the preliminary heating up, brings kilns off on time. Relative to the amounts noted per firing, this was based on Pittsburgh and Ohio coals. The amounts should be slightly increased for western coals which are of a lower calorific value. Following the chart, with a little experimenting, it is a simple matter to eliminate blowing and scaling, with the least possible increase in burning time. One thing must be noted, however, in this regard, and that is, that ware set green is a fertile cause for blowing, and that in all cases where this is found necessary an extra day or perhaps more should be allowed in burning.

Fire Cracking. This is a defect quite prevalent in the sewer-pipe industries, and a large percentage of loss can be attributed to it. There are several reasons for this defect, any one of which may cause a considerable amount of loss. If the pipe are set green, the chances are that a number of them will be fire-cracked when drawn, especially, if the clay happens to be short naturally. Hence in a case of this kind, it is necessary that ware be bone dry when set.

Another common cause is in the setting. Large pipe are set 4 high or 8 feet in all. In setting it is necessary that the upper pipe be perfectly centered in the pipe beneath. Failure to do so means unequal distribution of the weight of the pipe on the socket of the pipe beneath, which results in a cracked pipe. Too much emphasis cannot be placed on the care to be used in setting ware.

The third cause, and the one least understood, is that due to too rapid heat rising, caused by too heavy firing at any one period, and too long periods between fires. This causes the ware to heat up rapidly during the combustion of the fuel, and expand at the same time. The period between fires causes cooling in the ware, consequent contraction, and eventual cracking. The most sensitive point is as a rule the socket, and this is where the most cracking occurs. In order to eliminate losses of this kind, it is first necessary to avoid too heavy firing. The cleaning of the fires is the greatest danger period. Instead of cleaning every fire hole around the kiln, every other hole should be cleaned, thus permitting half the holes to admit cooling oxygen during the clean. Also short firing periods should be observed during the heat raising, and light fires used. This will be saving on the fuel, as well as reducing the fire cracking, but it will of course mean extra labor in firing. At one plant where it was almost impossible to burn large ware without excessive loss, the mere shortening of the firing period and the reduction of the amount used to a firing, almost eliminated this trouble.

Swelling. So much has been written on this subject and so fully has it been discussed, that I think it unnecessary to devote much space to this subject. Suffice to say that this trouble is directly due to improper oxidation of the carbon contents of the clay. Very little swelling is ever incurred in the fire clay districts, not because carbon is lacking in the clay, but because it is in smaller percentages, and in a form much more easily oxidized. Many fire-clay pipes show red centers which means too rapid oxidation, but swelling seldom occurs. Shale wares, however, show rapid oxidation by swelling, caused by the effort of the CO_2 to escape from the ware after partial vitrification has set in.

The one remedy is to use large trials, which method has been amply described in numerous articles.

Scumming. This is another defect which has been amply discussed. It may be due either to the presence of soluble salts in the clay or to those introduced with the tempering water in the preparation of the clay. This latter item is often overlooked. I know of a case in which soluble salts were introduced with the water used for tempering. The pipe showed up badly, scummed, and poorly glazed, even with use of excess barium carbonate. After the source of water was changed, the pipes were completely different in appearance. If change of water does not benefit, the only other recourse is to the use of a compound of barium.

Roughness — Crazing. There are a number of defects which show up in the last stages of the burning and these will be discussed under one heading because the defects are all attributable to one cause.

Roughness is a defect common to vitrified ware in general. Much has been written on this subject and numerous theories have been advanced, but roughness is just as common as it ever was. There are several varieties of roughness, or rather several causes to which roughness may be attributed, the first and last known is called iron spots. This is thought to

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*Reprinted by permission from the Transactions of the American Ceramic Society.

Kind of Ware	Length Burn in Days Shale	 Fire Clay	 Burn	1st Day	2nd Day	3rd Day	4th Day	5th Day
8 in., 10 in., 12 in. dia	5	4	days 4	shovels 2	shovels 2½	shovels Kiln cleaned, heat raised	shovels Finished	*
15 in. Single strength	6	5	5	1½	2	2½	Fires cleaned, heat raised	Finish
15 in. Double strength	7	5	6	1	1½	2	2½	Fires cleaned, and heat raised
18 in. Single strength	8	5	7	1	1	1½	2	2½
18 in Double strength	9	6	8	½	1	1	1½	2
20 in. S. S.	9	6	9	½	1½	1	1	1½
20 in. D. S.	10	7	10	½ shovel † every other fire hole	½ all around	½	1	1
22 in. S. S.	9	6	11	½ shovel every other fire hole	½ shovel every other fire hole	½ shovel all holes burning	½	1
22 in. D. S.	10	7	12	½ shovel every other fire hole	½ shovel every other fire hole	½ shovel all holes burning	½	½

* NOTE—Coal fired whenever necessary after fires are cleaned.

† NOTE—Where marked ½ shovel every other fire hole is meant only ½ kiln is lighted up.

Table 1 (Continued)

Kind of Ware	6th Day	7th Day	8th Day	9th Day	10th Day	11th Day	12th Day
8 in., 10 in., 12 in. dia	shovels *	shovels	shovels	shovels	shovels	shovels	shovels
15 in. S. S.	....	....	....	....	....	....	....
15 in. D. S.	Finish	....	....	....	....	....	....
18 in. S. S.	Clean fires, raise heat	Finish	....	....	....	....	....
18 in. D. S.	2½	Raise heat, clean fires	Finish	....	....	....	....
20 in. S. S.	2	2½	Clean fires, raise heat	Finish	....	....	....
20 in. D. S.	1½	2	2½	Clean fires, raise heat	Finish	....	....
22 in. S. S.	1	1½	2	2½	Clean fires, raise heat	Finish	....
22 in. D. S.	1	1	1½	2	2½	Clean fires, raise heat	Finish

NOTE—Where marked "½ shovel every other fire hole," is meant only ½ kiln lighted up.

be primarily caused by reducing action in the kiln, and will be discussed more fully later.

The second variety of roughness is due to the presence of carbon, generally in the form of a high carbon shale which does not become intimately mixed with the other clay in grinding. These particles remain in the surface of the ware and burn out eventually, leaving a cinder and very often a pitted surface. This is especially true in certain districts in Michigan, where a mixture of highly carboniferous shale and fire clay are used. The shale is so high in carbon that it burns out in spots, making a very rough looking pipe. In this particular case, the high carbon shale was eliminated from the mixture, and the roughness disappeared to a large extent.

(Continued on page 538.)

SEES GREAT ADVANTAGE IN MONOLITHIC METHOD

Engineer Rodney L. Bell Enthuses Over Brick Roads Built Without the Sand Cushion

ENGINEER RODNEY L. BELL of the Illinois State Highway Department has been in a position to see the monolithic brick paving construction installed in Illinois this year and is an enthusiast with regard to the results. The saving in cost of construction he places at ten to fifteen cents per square yard. But the point upon which he places the most emphasis is the entire absence of sand between the brick and the consequent thorough grouting under the newer method. His views are set forth in a paper read to the Northwestern Road Congress at Grand Rapids.

He finds that the new method is not so new after all. Baltimore, Cleveland, the Pennsylvania Terminal in New York, Springfield, Mo., and other localities had seen tentative experiments in the abolition of the sand cushion.

The Illinois highway department does not use cross expansion joints and believes, according to Mr. Bell, that they are not only useless, but destructive to brick roads.

Mr. Bell, last summer, visited a pavement that had blown up at Chrisman, Ill. This pavement was constructed in 1914, the brick being laid on a two-inch sand cushion and rolled with an eight-ton roller. An examination of the brick that had blown up showed that in a majority of the interstices the sand had been rolled up between the brick at least one-half of the depth of the brick, or about two inches.

To any one familiar with what brick will do under such conditions it is no wonder at all that this pavement refused to stay in place.

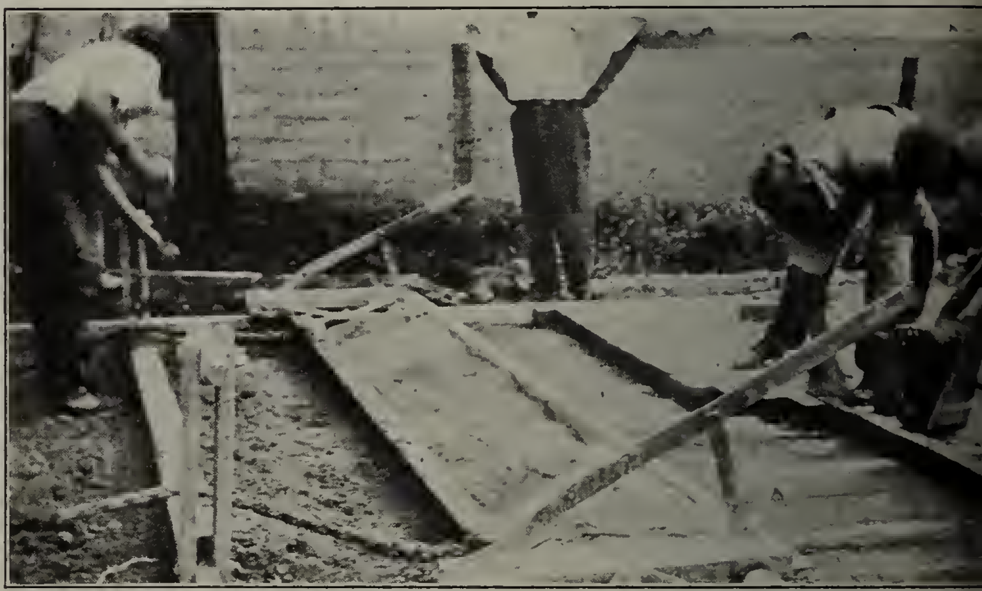
In the preparation of the sub-grade on the Illinois construction the rough work is generally done with a traction engine and a grader, the engine thoroughly compacting the sub-grade. The sub-grade is dressed up by hand, after which a five-ton, self-propelling roller is kept constantly at work while the material is being hauled. Steel forms eight inches in depth and twelve feet long are then set true to line and grade. The concrete base is four inches thick and the brick are four inches in depth, making, when completed, an eight-inch monolithic pavement. Steel forms, while not absolutely essential, are a great convenience in this type of construction, according to Mr. Bell.

The concrete for the base was a one-sixth mixture of cement and washed gravel. The gravel tested very close to 50 per cent. through a one-fourth-inch square mesh. The base for the state-aid work now under contract will be one part cement, three and one-half parts fine aggregate and six parts coarse aggregate. Enough water is used so that the concrete is of a quaky consistency, but will not flow. It is found that an excess of water caused no trouble in keeping the brick up to a true surface.

In order to get approximately the right thickness of concrete before it with the template, a small wooden guide is used. The steel template used is necessary in order to secure accurate results on this type of work. This template is made up of a six-inch I-beam in front and a six-inch channel behind. They are placed two feet apart and supported by four rollers, one at each end of each member. The rear edge of the template is set exactly four inches below the top of the forms and the front edge is set four and three-sixteenth inches below the top of the form. The hopper-like space between the two edges is kept filled with a dry mix consisting of one part cement, of five parts sand. The template is drawn forward, the front edge cuts the concrete three-sixteenths inch below grade and a thin film of dry mortar is spread over the concrete, filling all the little depressions in the surface. Theoretically, the dry mortar coat should be exactly three-sixteenths inch in thickness. In reality it does not have any noticeable thickness, but is sufficient to give a perfectly smooth surface for the brick.

It is essential to have the brick rolled within twenty to thirty minutes after the concrete base is laid, and to do this culling must be reduced to a minimum. The carriers are required to deliver the brick to the setter, so that he can easily lay them in the road with the good face up and the lugs all one way. In this way most of the culling is done by the carriers, and but very few brick need be turned after they are placed in the road. It is necessary for the setter to use a little more care than where a sand cushion is used; he is the only man in the gang who does not work at top speed. It is advisable to have two planks, 1 by 12 inches, and of a length equal to the width of the pavement, for the carriers to use when coming on the pavement. This saves tracking dirt on the brick, and also prevents uneven places in the pavement, due to the fact that the carriers will all come on the pavement at about the same place.

As soon as the brick are laid, the necessary culling and batting is done, the pavement swept and rolled. A two-section roller, 30 inches long and 24 inches in diameter, and weighing about 750 pounds, is used. This roller is easily handled by one man and leaves a much better surface than it is possible to secure with the old type of construction. The brick are not embedded more than ¼ inch in the base.



Template by Which Dry Mortar Mix Is Spread On Green Concrete Just in Advance of Brick Laying

A 1:1 mix of cement and sand is used for the grout filler. This is mixed dry in a small batch mixer and then conveyed to the grout boxes on the pavement by means of wheelbarrows. The maximum size of batch allowed in the boxes is 2 cubic feet of the mixture. Water is added slowly and the mortar built up gradually, after which it is thinned to a consistency that will flow readily into the joints. The grout is stirred constantly while being removed from the boxes with scoop shovels. The joints are filled completely at the first application, but after settling the top of the grout is about ½ inch below the top of the brick. Before the first application has taken its initial set, the joints are filled a second time. The second application of the grout is mixed to a consistency of thick cream. In making this second application enough surplus is left on the road so that the surface can be gone over again without bringing the boxes back. The surface is finished with a squeegee, the joints being entirely filled.

In order to secure the best surface the squeegees are pulled over the road at an angle of 45 degrees with the joints. This prevents the squeegee from dragging mortar out of joints and leaving them lower than the surface of the brick. The pavement is covered the following day with ½ inch of sand or earth, which is kept wet at least five days. The side forms are removed the second day. The pavement is allowed to set ten days before the side roads are graded and three weeks before being opened to traffic.

PAVING BRICK INSTITUTE TO MEET IN ST. LOUIS MAY 8TH AND 9TH, 1917.

A large attendance of paving brick manufacturers from all sections of the country is expected at the Jefferson Hotel, St. Louis, May 8th and 9th, on the occasion of the meeting of the Institute of Paving Brick Manufacturers.

Where One Day's Work Has Ended and Another Begun on Monolithic Construction

Grout Filler Extends to Bottom of the Brick, Thus Bonding the Work Into a Solid Monolith

Features of the program will be the formal presentation of a cost accounting plan and the following papers:

"Dies," by Mr. Robert Keplinger of the Metropolitan Paving Brick Company; "Use of Powdered Coal as a Fuel," by Mr. George Holbeck of the Bonnot Company; "Use of Explosives in Shale Quarrying," by Mr. E. T. Lenum of the E. I. Du Pont de Memours Powder Company; Mr. Eben Rodgers of the Alton Brick Company will discuss "Electric Drives."

The program will begin at 10 a. m. on the morning of May 8 and will continue during the afternoon. An evening dinner will be served at 6:30.

The program will be resumed at 9 a. m. on the morning of the ninth and the afternoon will be devoted to an inspection of plants in the vicinity of St. Louis.

The Institute of Paving Brick Manufacturers engaged Ernst & Ernst, expert accountants, for the purpose of establishing a practical cost finding procedure uniformly adapted to the requirements of paving brick manufacturing enterprises. William Burr of this firm, experienced in cost finding methods in connection with various manufacturing enterprises, conducted a complete investigation relative to the processes of manufacture and the physical conditions existing in a number of the largest paving brick plants in this country. The report on uniform cost finding prepared for the Institute of Paving Brick Manufacturers is the result of the information acquired in pursuit of wide investigations and a study of cost finding methods applicable to kindred manufacturing enterprises.

This report presents in considerable detail a discussion relative to a complete distribution of expenses incident to the manufacture of paving brick and devotes careful consideration to the proper handling of the various items of production and manufacturing expense which materially affect the determination of accurate costs.

A number of features have been introduced into this report which are peculiar to cost finding as applied to the paving brick industry and which have not been discussed in other reports presented on this subject. These innovations in cost finding and accounting as applied to the manufacture of paving brick has a tendency to create a more lively interest on the subject in the mind of one who takes occasion to make this report the subject of careful study.

Beginning with the operating expenses incident to the mining of clay or shale and the transportation thereof to crusher and dry pans, the cost finding procedure systematically is carried down through the various manufacturing processes to the point where is determined the complete cost of first grade brick on cars ready for delivery.

DIGGING CLAY AND SHALE.

There are a number of reasons why the Thew Steam Shovels are popular with clayworkers, and these reasons are set forth and illustrated in an interesting way in circular No. 27, recently issued by the Thew Automatic Shovel Co., Lorain, Ohio. The Thew Shovel is both efficient and economical in operation. Its first cost is reasonable and the up keep is nominal. See ad on page 550. Their circular, No. 27, can be had for the asking. Among other things it contains some interesting data on Clay Pit Costs.

THE CLAY PIPE BOOK.

The above is the title of an interesting little booklet published by the International Clay Products Bureau, Kansas City, Mo. It tells in a graphic way of the utility of sewer pipe and the benefits that accrue to the ultimate consumer from its use. There are a number of unusual illustrations, showing sewer pipe in course of manufacture, and the improved methods of laying same, both for sewage and for land drainage purposes, all cleverly arranged with side heads, making it a handy book for ready reference. Doubtless a copy will be mailed to any reader of The Clay-Worker on application.

BUILD WITH BRICK AND REDUCE FIRE WASTE.

The way to get lower insurance rates is to have fewer fires.

An ounce of fire prevention is worth a pound of fire extinguishment.

Over 5,000 are killed and 50,000 are injured annually as a result of fire.

If buildings in the United States were as fire-proof as in Europe, the annual cost of fire losses and protection would be only $90,000,000.

BRICK AND CLAY NEWS FROM THE TWIN CITIES AND THE NORTHWEST.

Written for The Clay-Worker.

THE BUILDING SEASON OF 1917 has been a peculiar one, so far. With a winter which has broken all records and has left old-timers gasping for a comparison, the earlier months were marked by considerable preliminary activity and a great deal of preliminary figuring, especially on larger operations. But with the frequent increases in costs of structural materials, steel, and of cement, as well as of other goods, there has been a steady decline in the amount of large work considered. Whether this will be only a temporary matter remains to be seen. Many public buildings, such as school houses, have been figured, but the bids have been so much in excess of the appropriations that they have been either revised and refigured, or have been deferred until prices are lower.

The same causes which have forced higher prices on other materials, have affected brick, and common brick are selling in the local market at around $8.75—a price which is a very fair one, but which seems high compared with figures which were received only a few years ago. But coal is so much higher than it was only a year ago there is hardly a comparison between the two seasons. Oils are higher. Labor is higher. In fact, every factor entering into the manufacture and sale of brick is higher, and naturally, the cost is higher. Fortunately the manufacturers of brick in these cities have been able to place their selling price upon the basis of their cost, having found through bitter experience, that it does not pay to sell below cost.

The chances are that there will be a reaction which will revive building in the larger structures. Smaller construction has been going ahead freely, though even here has been something of a letup.

The Northwest Face Brick Association has recently been organized, with headquarters in the Midway district, at Prior and University avenues, St. Paul. Clarence E. Gunn, well known from his long association with the brick business of the Twin Cities, is secretary, and in charge of the offices. The association is composed of all the face brick concerns of St. Paul and Minneapolis. The purpose of the association is to develop a better and larger field for brick. In completing the preliminary work, much detail has been found necessary, but when completed, it is the intention of the officers to do development and publicity work for the furtherance of the use of clay products. The organization is most opportune, as it comes into a country which is wedded to frame construction, and yet has a terrific waste from fire losses year after year.

The Colburn-Murray Brick Co., of Minneapolis, has amended its title to the Colburn Brick & Tile Co. Mr. T. J. Murray has retired from active connection with the company, and will engage in other work—probably in his own name—in connection with the brick business. The Colburn Brick and Tile Co. is just developing a much wider line of business, including face and common brick and building tile. A large plant near Zumbrota, Minn., has been secured, and will be operated on a large scale. The company has a number of lines, such as terra cotta, and allied goods, which are handled for the Northwest.

The Hebron Fire & Pressed Brick Co., of Hebron, N. D., looks forward to the largest year in its history. Several contracts for large amounts have been taken, including the government postoffice building at Dickinson, N. D., the high school building at Grand Forks, N. D., and a number of other lesser buildings, totaling about the entire season's output. The company is fortunate in having fuel, in the form of lignite, available at Hebron, so there is not the slightest difficulty in securing fuel. The plant which was described in an illustrated talk at the national convention, operates with gas produced from lignite.

The Northwest has a number of school houses projected for this season, but half of those figured so far, have been deferred on account of the high prices. As they all use brick in construction, there will be considerable business deferred on this account. The same thing is true of private work.

The Builders' Exchange, of Minneapolis, has started excavation for its proposed ten-story office and display room building at 609-613 Second Avenue South. The contract for the building itself has not been let, but it is confidently expected to go ahead this year. Some of the largest contractors of the city, who erect some of the best buildings, are members, and have stock in the enterprise. It is expected to have the building ready to occupy about December 1.

T. WIN.

BRICK COMPANY INSURES EMPLOYES.

The Elk Fire Brick Company, St. Marys, Pa., put into effect April 1 a plan whereby insurance is provided for all who have been continuously in the employ of the company for a period of three months or more. J. D. Ramsay, president of the company, gives the following outline of the plan:

(1) The policy will become effective April 1, 1917. (2) All employes who have been continuously in the employ of the company for a period of three months or more will be covered under this policy. (3) All employes will be insured without medical examination. (4) The amount of insurance on each will be $500. (5) The amount of each certificate will be increased January 1, 1918, to $600 to all employes who are insured under the policy on July 1, 1917, and who continue in the employ of the concern until December 31, 1917. (6) The insurance will be payable to any one whom you may designate as your beneficiary. (7) The Elk Fire Brick Company pays all costs of the insurance and furnishes it free of charge to the employes. (8) The Elk Fire Brick Company reserves the right to make such changes in this insurance plan on April 1, 1918, as may seem best for the interest of the employes and the company. (9) This plan of insurance has no legal bearing on compensation and does not affect your right under the compensation act in any manner. This is an additional item for you in case of death, either accidental or natural. (10) This plan does not have any bearing on the wages now being paid by the company or on wages paid in the future; it is not given in lieu of wages, but it is a form of protection for you and yours. (11) In case of total disability the amount of insurance carried on your life will be payable to you in installments, the details of which will be given later.

ALWAYS ROOM FOR IMPROVEMENT

The fact that brick making is one of the oldest industries in the world does not hinder the coming or the usefulness of new ideas, for there is always something to learn and always room for improvement.

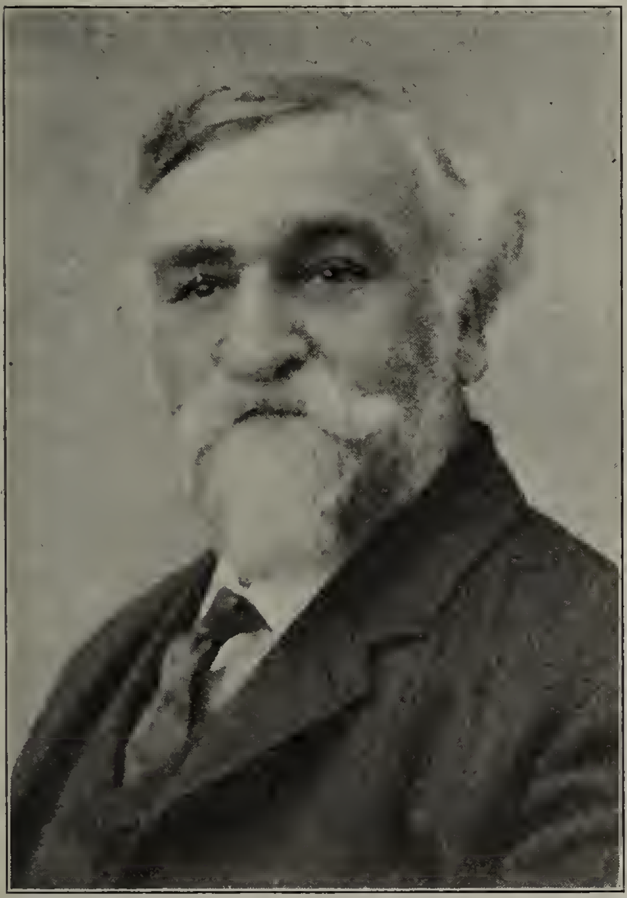
CHICAGOANS TAKE CHARGE OF A TENNESSE FIRE BRICK PLANT.

The Jackson Fire Brick Company, at Gilmore, Tenn., is being overhauled and re-equipped. The management recently passed into the hands of Chicago parties, Mr. F. O. Hamilton, president and manager; John J. Moroney, vice president; Charles E. Hamilton, treasurer, and Frank B. Calmeyn, secretary. It is the intention of the company to make a high-grade fire brick. They have an inexhaustible supply of fire clay and with the new equipment will be able to supply the trade with an excellent grade of fire brick.

NOTABLE BRICK PLANT; MAN WHO FOUNDED IT

When James Whitcomb Riley celebrated his birthday and flowers and kind words and loving messages came to him from all parts of the country, he exclaimed in his joy and heartfelt gratitude: "It is certainly good to be alive."

The very next day it was my good fortune to meet another American citizen who was full of the joy of living. He is in the evening of life, although he has years and years of usefulness before him yet. He is a success in the world of business and his name is respected and honored. He has the good will of the people among whom he has lived for over thirty years, and the friendship of the people with whom he has had business transactions. This gentleman is Mr. J. W. McMillan, proprietor of the Milledgeville Brick Works, and member of the contracting firm of McMillan & Sons.



J. W. McMillan, Milledgeville, Ga.

"I have been treated far better than I deserve," he said very simply and modestly. "Our friends have been kind and our business has prospered. The same people who were on our books when we started here over thirty years ago are still patronizing us. I have children. I have recovered from the effects of an accident which kept me at home for months and feel well again. I have nothing to complain of and a great deal to be thankful for."

The visitor to Milledgeville, when he starts down in the Oconee river valley in the general direction of the Milledgeville Brick Works, has no difficulty in locating the plant, for it is advertised far and wide by an enormous brick smoke stack, over 15 feet in diameter at the base, which rises in the air to a distance of 150 feet. This great chimney serves a double purpose, for it provides the draft for the kiln. Continuous-burning Haigh kiln of the latest type are used. The plant has a capacity of about 40,000 brick a day and the company's sales in recent months have been up to capacity. The Milledgeville Brick Works has customers scattered all through Georgia and Florida.

The great, high chimney is not the only thing that catches the visitor's eye as he approaches. The Milledgeville Brick Works has an office building that instantly attracts attention. It is two stories high, of brick construction, of course, and very classy in its general appearance. Flowers bloom all around it, in tastefully arranged plots, and so when one enters the office he is not surprised to see a woman there. One of Mr. McMillan's daughters keeps the books and looks after other office detail, and, it is needless to say, is also the general manager of the floral department.

Mr. McMillan, who is now in the sixties, was born in Scotland. His father before him was a brick manufacturer, and he learned the business in Glasgow. Coming to this country when quite a young man, he located at Madison, Ga., where he followed the contracting business for thirteen years, and then, thirty-two years ago, came to Milledgeville and established the Milledgeville Brick Works.

The Milledgeville Brick Works makes a brick that is noted for its unusually high quality. I asked Mr. McMillan as to the quality of the clay here in the Oconee river valley—he owns about a mile of river front—and he replied, with great deliberation:

"I have examined clays in Scotland and in Canada and in various other parts of the United States, and wish to say without qualification that this is the finest deposit of brickmaking clay I have ever seen. We mix this clay with shale, in the proportion of about half and half."

"Shale!" I exclaimed. "Shale in this part of Georgia?"

"It's a geological freak," explained Mr. McMillan. "That big hill just behind us is almost solid shale. It's the only deposit of shale in this part of Georgia that I know of. So, this plant is placed at exactly the right spot. We mix the clay and shale and it makes a very fine, durable brick."

Mr. McMillan has had many interesting business experiences in his long life. One of them illustrates his high sense of honor and its recognition on the part of those who know him. A Jewish business man in a middle Georgia town wanted him to build a block of brick stores. The Scotchman told him that it would cost about $11,000, and the other told him to go ahead. There was not the scratch of a pen—simply the verbal understanding between the two men. The building completed, Mr. McMillan presented his bill and it was promptly paid.

When this very pleasant visit came to an end and it was time to go, the old gentleman walked down the lane with me, opened the gate in person, and coupled with his hearty handshake a word of commendation and encouragement that brought a glow to the heart; and in that instant I understood why everybody in this whole section of Georgia likes J. W. McMillan.—The American Clay Magazine.

INTERESTING THE REAL ESTATE MEN.

Some years ago the oak flooring people succeeded in presenting convincing argument to real estate men and others building homes for sale that the slight increased cost required to put down oak floors would add much more to the selling value of the house than this difference in cost.

It proved to be good argument, too, and the real estate men experimenting wtih it found that it was of material aid in selling new homes to have them floored with oak, and that this increased the selling value of the house probably twice the cost of the floor.

This illustrative instance is a sort of preamble to a plea for interesting the real estate men in brick construction on the same ground. There has been some effective work done along this line already, and there is room for quite a lot more. Real estate men are quick to understand a proposition of this kind and see when it has merit.

The main need at the present time is for the brick men to keep the matter before the promoters of real estate, especially suburban, for if they can keep in touch with them they can bring forth plenty of convincing argument that the best and cheapest way to make a good selling house and to put a selling value into the house, is to build with brick. The point is to get in touch and keep in touch with the real estate men and builders, keep them interested and make them understand the qualities and talking points of brick, and it will mean a whole lot more in the way of an enlarged consumption of brick and clay products.

REDUCE THE FIRE WASTE

Every Citizen Can Help to Conserve the National Resources.

The man who cannot fight or farm can render a patriotic service in this time of need by helping to conserve the nation's resources. One of its greatest drains has been its preventable fire waste. Two hundred million dollars have been going up in smoke each year, and most of this loss could easily have been prevented by the exercise of reasonable precautions. Much of the property destroyed was grain, foodstuffs and supplies of which the country and its allies are now in serious need. The citizen who cannot go to the front can show his patriotism by doing everything possible to reduce the fire waste and thus conserve the natural resources.

President Wilson, in his appeal to the public, pointed out this patriotic duty when he said: "This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful, provident use and expenditure as a public duty, as a dictate to patriotism which no one can now expect ever to be excused or forgiven for ignoring." The preventable fire waste of the country is one of its most "unpardonable faults." The state fire marshals and other experts agree that 75 per cent. of it is due to carelessness, individual and municipal. What a crime it has been, in view of the present crisis, that over fifty million bushels of wheat have been burned during the past year, on the farms and in the grain elevators of the country! Most of this loss also was due to carelessness and lack of the ordinary precaution against fire.

If property owners would clean up their premises, get the rubbish out of their attics and basements, be careful about matches and smoking, inspect their flues and heating appliances, and do the ordinary, common-sense things necessary to reduce the fire waste, they would perform a patriotic service, would protect life and property, and would pave the way for lower insurance rates.

ARE YOU ADVERTISING?

This promises to be a year of unusual activity in exploiting building material and building specialties of all kinds. Are you doing your part? Are you advertising brick locally? If not, it is time to get busy.

The best advertising for the money that has yet been evolved is made up of those Build-with-Brick signs, which are already famous the country over. That is, with a goodly number of these one can do a lot of splendid advertising with very little cost. Naturally, therefore, every man should see that his community is fairly well spotted with Build-with-Brick signs.

Then, there should be other advertising: advertising in local papers, distribution of circulars, and wherever there are two or more brick men in a community, they should get together and combine their interests to the end that this advertising may be more effective. It will enable them to take larger space in the papers and to combine interest and get out circulars that are uniform, and there are many ways to effect greater efficiency by co-operating together in this work and co-operative boosting of brick is much better than antagonistic advertising of one against the other. Then, finally, not only should the brick men of a community get together and advertise, but they may well also get in touch with brick contractors and bricklayers and arouse their interest. In some cases, they may be disposed to come in and co-operate actively, and even if they are not prepared to do much of that, they will certainly be interested and will help distribute circular matter and to boost the game generally. So, if you have not started to advertise already, get busy and get everybody else connected with the clayworking industry interested and in action.

THE CHICAGO BUILDING SITUATION.

CONSIDERABLE dullness is apparent in the building line in and about Chicago. If general conditions continue good for a few weeks longer, however, it is believed that building will go ahead at its normal rate, or nearly so. Building has not been brisk at all this year, and during the last few weeks, it has seemed to be more at a standstill than previously. This has been attributed to extreme caution on the part of the investing builders, especially of apartment buildings. They have been confronted with no difficulty in borrowing money and rates have been anything but prohibitive, but with national conditions unsettled they have not wanted to risk putting in their principal until the probable tenancy of their prospective buildings appeared at least reasonably well assured.

There has been a falling off in construction of plants and factories, but this has been due to local rather than to general conditions, and hope is entertained that the industrial situation will improve during the coming months and that normal development will be resumed. In the absence of this type of construction other lines have not been idle. Apartment buildings, large and small, hotels in the outlying districts and similar structures are being planned and inaugurated daily.

A big fireproof hotel of the highest type of construction is planned for the Hyde Park district, near Lake Michigan. It will be known as the Cooper-Carlton, and will rise to a height of eleven stories, at the southeast corner of East Fifty-third street and East End avenue, representing, with the land upon which it is to stand, an investment of $1,350,000. The design will be modern Roman, with an exterior of dark pressed brick and trim of terra cotta and granite. On the first floor there will be elaborately decorated lobbies, banquet and dining halls, and space for nine shops. The upper stories will contain 380 rooms.

A brick-clad structure now nearing completion on the South Side, is interesting not only for itself, but because it probably indicates a new trend in the development of the city, which will grow more noticeable in the next few years. This is the new office building of the Illinois Central Railroad Company which is being erected at East Sixty-third street and the Illinois Central tracks, at the farthest outlying terminal station of that road. The building which will be ten stories in height, with provision for additional floors, as needed, will take the place of the office building at Park Row (Twelfth street), which is practically outgrown. Meacham and Wright supplied the brick for the exterior, which is of rough, attractive finish, and dark. The moving of the general offices away from the central portion of the city and into what is actually a residential portion of town, is a good deal of a novelty, but may be expected to work out well from the standpoint both of company and of employes. Most of the office employes undoubtedly will live within easy walking distance of their work. This not only will be a saving to the pocketbooks of the employes themselves, but will save them a long trip from home and back again by train or street car each day. This latter in a great city is no inconsiderable item of economic waste and by eliminating the customary wear and tear, these clerks, stenographers, etc., should be worth much more to the company and to themselves.

One of the industrial enterprises which is contemplated is the erection for the James A. Brady Foundry Company of a large modern plant costing about $300,000, at the northeast corner of Western avenue boulevard and West Forty-fifth street.

McNeil and Higgins, one of the oldest wholesale grocery houses in Chicago, are completing a new eight-story plant, which is expected to be ready for occupancy about May 1. It will be eight stories in height and at Fairbanks court and East Grand avenue, running back to the Chicago & Northwestern tracks.

While business is not all that it might be no feelings of depression are expressed and the conviction is felt that improvement is certain to follow in a short time.

Of more personal interest is the recent return from a vacation trip through the southwest of W. D. Gates, president of the American Terra Cotta and Ceramic Company.

SCRIP.

DU PONT COMPANY ACQUIRES PAINT MANUFACTURING COMPANY.

At a recent meeting of the stockholders of the Harrison Brothers & Company, Inc., of Philadelphia, the stockholders agreed to accept the offer made by the Du Pont Company, of Wilmington, Del., and the paint firm became one of the Du Pont's subsidiaries.

The sale marks the union of two of the oldest and best-known manufacturing firms in the country. The Harrisons date from 1793 and the Du Ponts from 1802. The transfer to new owners will bring no radical change in the conduct of the paint business. This will be continued by the new owners and the products hitherto turned out by the Harrisons will continue to be made by virtually the same organization.

The price paid by the Du Ponts is $5,700,000 in cash, the purchasers assuming all the outstanding obligations of the company.

The business will be conducted by a new Pennsylvania corporation, to be known as "Harrisons, Inc.," a charter for which has been applied for.. The incorporators are Lammot Du Pont, Dr. Charles L. Reese and Charles A. Meade, of the Du Pont Company; A. R. Glancy and Wm. Richter, secretary of the Harrison Company.

THE BOOK OF SMILES.

The current issue of "The Book of Smiles" has been received. It contains the usual number of smiles per page. Among them is the following under the heading,

"A Motto for Margaret."

No current topic is more stimulating, edifying and diverting than "Birth Control"; no tea party is complete without it, declares Bert Leston Taylor, the far-famed "B. L. T." of the Chicago Tribune. He continues: "There is under way a publication devoted to the subject, to be edited by Margaret Sanger. May we suggest to Margaret as a motto for her magazine the couplet—

"There was an old woman who lived in a shoe;
She had so many children 'cause she didn't know what to do."

As usual, the little volume touches seriously upon the drying end of the brick business. Among other clever and timely things is the following comment on the recent national convention:

The Inspiration of the Convention.

Sent many a brick manufacturer home a bigger business man—with mind refreshed and spirit uplifted—self-pledged to plans of betterment.

"We must modernize the old plant. The way to bigger things lies through better methods. We need this, that and t'other. Here efficiency can be increased. There we shall reduce upkeep. Faulty equipment and antiquated ideas must go. We've misled ourselves long enough. Costs must come out into broad daylight—we'll do away with guesswork."

Are your thoughts running in this channel? Are you ready to investigate and study an improved method of drying your product? Does a definite written guaranty of successful results interest you?

Get all the facts about The Standard Brick Drier from us and from the many live brickmakers who use it. Begin by writing for the catalog. Address The Standard Dry Kiln Company, Indianapolis, Ind.

PLANT MANAGEMENT

By Richard B. Hoehne

Part II

OWING to the marked uniformity in the trade, a superintendent need not be hired from the immediate neighborhood; the opportunity should be advertised, instead, to obtain a desirable competition among the applicants. It may be true that the man from "next door" could be more easily identified as to his character and qualification; yet there are splendid facilities to ascertain the fitness of aspirants also from far distanoes. Hence, the locality should not induce any restrictions, while, on the other hand, it is essential to advocate a distinction between the different branches of manufacture. To enlighten this view, I will call attention to the vast field covered by the ceramic industry; having steadily expanded in the course of time, it has split into branches, which, compared with other industries, have gained full strength of individuality. Each one of these sub-industries is worked with different tools and equipment mastered by well defined ways of procedure. While in the making of common grades of ware, as a rule, the volume of finished product is the main object. This very demand must yield to the attainment of quality, more important in the manufacture of finer products. This may explain that it is not advisable to hire superintendents from one line of manufacture into another, because a man cannot readily acquaint himself with methods contrary to his experience and customs. customs.

In establishing new enterprises, divided opinion is noticeable regarding the most opportune time at which superintendents should be taken on. If common sense alone is to decide this question, the reply can only be to the effect that a superintendent should be the very first person entering the employ of a new concern. This is based upon the presumption, however, that none but a qualified man is selected, who would during the earlier stages act as an adviser to the management. In this capacity his practical experience could be of valuable service in the selection of equipment and in planing the general layout of the plant. He would also make himself useful in the preparatory work of starting the clay pit, investigating the deposits of raw materials and determining their peculiarities with reference to mixture, shrinkage, drying and burning. Moreover, he would have an expedient chance to secure and organize his crew for the ensuing construction and operation of the plant. Looking at the subject from a financial standpoint, some might oppose this theory as being uneconomic, by maintaining that the superintendent's work does not begin prior to the completion of the factory. In the school of experience a much greater want of economy may be easily recognized, though, in carrying on the preliminary experiments with a complete plant and a costly crew of men, consisting of twenty to fifty hands, sometimes even more.

During the actual construction of a plant a multitude of details is awaiting the attention of the management. Seldom is the fact fully realized that this is the most seasonable time to check carelessness and incompetence, which in time would react upon the very life and existence of the plant. Mistakes made at this stage are generally concealed until the operation starts, frequently much longer. In my efficiency practice many cases have occurred where I was obliged to lay the cause of trouble or misfortune upon errors dating back to the earliest stages of the plant. The popular method of employing cheap and incompetent men to supervise the erection is the original cause of many breakdowns and subsequent renewals in the equipment. I recall scores of machines, defective in operation on account of shaky foundations and insufficient anchoring, not to speak of down-draft kilns I had to pronounce unfit for further use, after but five years of operation. In this connection I will not fail to mention a plant where I was accorded a fair demonstration of what the life of down-draft kilns ought to be. This concern being located in the State of Indiana, showed me rectangular down-draft kilns, which had been continually used since 1891, while the management expressed confidence to obtain another twenty-five years of service from the same kilns.

The various functions ascribed to plant management could be viewed as a subjugation of forces. Undoubtedly, it is a force that drives a pug mill or revolver press; it is also a force that causes a car or wheelbarrow to roll along on a track; another force causes the temperature in the kilns to rise or sink; and still another force is responsible for the early destruction of a tall smoke stack not built right. In fact, every motion is the result of active force. According to the principles of science, all "force" is originally produced by nature, whence it could logically be spoken of as "natural force." Lest it appear as a disregard of established rules, the subsequent citation of other terms shall be explained by the urgency of signifying the specific character in which "forces" are utilized in behalf of manufacture. For instance, an entirely rude and natural form is characteristic of the agents employed in drying and burning; namely, fire, heat, air, etc., thus called "natural forces," while for other purposes forces are applied in a refined state, after passing a transformation by men or machines, thus producing "human force," or "mechanical force," respectively. As example may be quoted the work of steam engines or electric generators transmitting force from a natural state into mechanical. Consequently, "mechanical force" is identical with the energy extracted from, or produced by, machines. A mechanical force is the agent responsible for the operation of a brick machine, while in turn the latter develops mechanical force to expel the clay bar through the die. "Human forces" are represented by the energy of workmen exclusively.

To expedite an exhaustive exploitation, the further disposition of the selected theme will take reference to the "forces" submissive to plant management, by treating:

1. The mechanical forces.
2. The natural forces.
3. The human forces.

(To be continued.)

NEW YORK AND VICINITY.

Brick from up the Hudson have begun to arrive in the Metropolitan district and are quickly absorbed by the demand for building material which has developed as a part of the regular business of the community. It seems from what can be learned that the outlook for building in New York was never better than it is now. The fear of war may deter some from proceeding with the developments they plan, but the possibility of war has made an intensely American city of New York and nothing is slowing up. Every industry is humming and the building operations now planned will be developed regardless of the possible danger of invasion or bombardment or whatever else may eventuate.

Most property owners have taken out bombardment insurance and also have insured against Zeppelin bombs. Now they are going their way and will do nothing to deter the movement of what is now planned.

Common brick is a shade more plentiful than it was, but not enough is coming down the river to keep the operations all going. The price is nominally $10.00, but it often goes higher than that because none is obtainable and buyers feel as though they must have the material. No. 1 hard brick are quoted now the same as Hudson river common.

In considering what will be done up the river this season one has to take into consideration the labor shortage, which is quite as pronounced in New York as it is in New Jersey. No one knows where the men to operate the plants are to be found. With the outlook for demand the best ever known and with the price high enough to insure a good profit, makers are confronted with a labor shortage which promises to be vital in some localities. Those firms which have run all winter have had an advantage which they cannot hold long now. They will lose their men, or the surplus men, because they can do better elsewhere. A search for more workmen is active, but it must be confessed that few are found.

A. L. B.

E. J. ANDERLE JOINS THE SERVICE DEPARTMENT OF THE INTERNATIONAL MACHINERY CO.

"International Service" has a new exponent, Mr. E. J. Anderle, of Chicago, Ill. Mr. Anderle will be assistant to the sales manager, R. H. McElroy, and have charge of International's testing department. He is well equipped for the work, being a graduate in ceramics from the University of Illinois, was an apprentice for some months in the educational course of a large clayworking machinery manufacturer, and since has been connected with the Robinson Clay Products Company, of Akron, O., in an engineering and efficiency way.

Mr. Anderle, we feel sure, will be a valuable addition to the testing and engineering service that International is giving clayworkers.

E. J. Anderle, Dayton, O.

The Southern Clay Manufacturing Company, Chattanooga, Tenn., has closed contracts for 1,000,000 Dunn wire-cut lug brick at Roanoke, Ala., and Dalton, Ga., each adopting the modern economical type of construction of laying the brick on a one-inch cement-sand cushion as a monolithic base and eliminating the concrete foundation, but filling the joints of the pavement with cement grout, thus making a watertight smooth surface.

DEATH OF A WELL-KNOWN HOOSIER BRICKWORKER.

Frank W. Makepeace, age fifty-eight, president of the Indiana Brick Company, of Anderson, died of apoplexy recently at his home. He was stricken early Thursday and never regained consciousness. Up to that time he was apparently in good health. Mr. Makepeace is survived by his widow, Mrs. Mary Makepeace, and his mother, Mrs. Margaret Makepeace, widow of Captain Alonzo I. Makepeace. He was born in this city and had been active in business affairs for more than thirty years.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

CONVENTION ECHOES

CONVENTION WONDERFUL IN INTEREST.

Dear Mr. Randall—Please send me an extra copy of The Clay-Worker containing a report of the meeting of the National Brick Manufacturers' Association. Check will be sent on presentation of bill.

Though a little late, I want to express my appreciation of your meeting, for I thought it wonderful, both in attendance and interest when considering the attractions of the big city. I enjoyed the whole occasion very much.

ROSS C. PURDY.

CONVENTION PAPERS HIGH CLASS.

Dear Mr. Secretary—I was under the weather for two or three days after returning from New York and was not able to write you in regard to my impressions of the convention.

I was especially pleased with the trip to New York City and with our reception by the Eastern clay workers, and was much impressed with the papers that were read before the convention and the interest in the general discussions. I think the papers were all high class and the discussions were intelligent and instructive.

The attendance was all we could expect to see in New York as there are so many counter attractions. The entertainment provided by the New York clayworkers was certainly appreciated by myself and wife and the banquet was one of the very best and the toasts were above the average, which is saying a great deal for the N. B. M. A. banquet.

I trust that you are all settled back to regular work again and hope to drop in and see you some day in your own shop.

Yours very truly,

J. W. ROBB,
Clinton, Ind.

CONVENTION WEEK A BUSY ONE.

Dear Mr. Randall: We are in receipt of your Special Convention Number and congratulate you very much on same. The attendance was all that could have been expected in view of unsettled business conditions.

I did not attend either the Cleveland or Detroit Conventions, owing to being out of the business at that time, and it surely was a pleasure to renew acquaintance with old members at New York and to meet so many new ones. We were kept busy every moment meeting the different manufacturers attending the convention and calling upon the New York concerns whom we represent and, for that reason, did not find as much time to attend the convention sessions as we would have liked.

There were many interesting features, but the most striking feature, in the writer's estimation, was the large percentage of ladies in attendance. We have no doubt but that the call of Broadway is responsible for the attendance of some of them, but is it not a fact that the members of the N. B. M. A. are realizing more each year that the best in the world of business and pleasure can be secured when understood and enjoyed by all members of the family firm?

With very best regards to yourself and members of your family, we are, as ever, Very truly yours,

Buffalo, N. Y. EDWIN F. KNIGHT.

A CONSPICUOUS BUTTON-HOLER.

One of the pleasant incidents of the recent N. B. M. A. convention on Broadway was a chat with Grafton E. Luce, the affable representative of the Lambert System of Burning Brick. Mr. Luce has been in the brick game for many years and has visited the brick and tile plants in every section of the country. In doing so he has garnered a fund of information on how not to make brick, as well as the essentials of success in the business that makes him a very interesting "button-holer." He is thoroughly familiar with every phase of the business, knows well the peculiarities of clay and how to make, dry and burn the ware. He declares that the Lambert system is adapted to and can be used successfully with most building clays if properly applied. The system has been in use on the great plants of the Illinois Brick Company at Chicago for several seasons, and Mr. Luce insists that it can be used in many, if not most all, of the brickmaking centers with equal advantage. If you, Mr. Brickmaker, are open to conviction in this matter, talk with Mr. Luce. He is a very convincing talker. His office is at 155 North Clark street, Chicago, but his "headquarters is in the saddle," so to speak. If you want the latest word in brick burning, write for the Lambert catalogue and ask Mr. Luce to call and see you when in your vicinity. He has such a wide acquaintance in the trade that introduction may not be necessary. However, we are pleased to present his counter-presentment.

Grafton E. Luce, Chicago.

The Harbison-Walker Refractories Company of Pittsburg, Pa., with brick plants at Philipsburg, Retort, Wallaceton, Woodland, Clearfield and other points, announces that, beginning May 1, the wages of all employes will be increased 20 cents a day. Several thousand men will be benefited. On March 1 of this year the company advanced wages 15 per cent. The employes have also been notified that they may use any part of the company land for gardening.

THE UP-TO-DATE WAY OF HAULING PRODUCTS AND PARCELS

"EFFICIENT ELECTRIC TRACTOR."

JUDGED BY APPEARANCE only, no one would suspect the electric tractor shown in the picture of being able to pull several loaded trucks through the streets, yet the American Express Company has a large number of these tractors engaged in the work.

This tractor is a modification of the Standard Electromobile Tractor and was built especially for the American Express Company by the Orenstein-Arthur Koppel Company, of Koppel, Pa. With a wheel-base of 30 inches, it can turn in a radius of 4 feet 9 inches, which enables it to operate freely indoors as well as on the street.

A load of 15,000 lbs. can be pushed or pulled at a maximum speed of seven miles per hour.

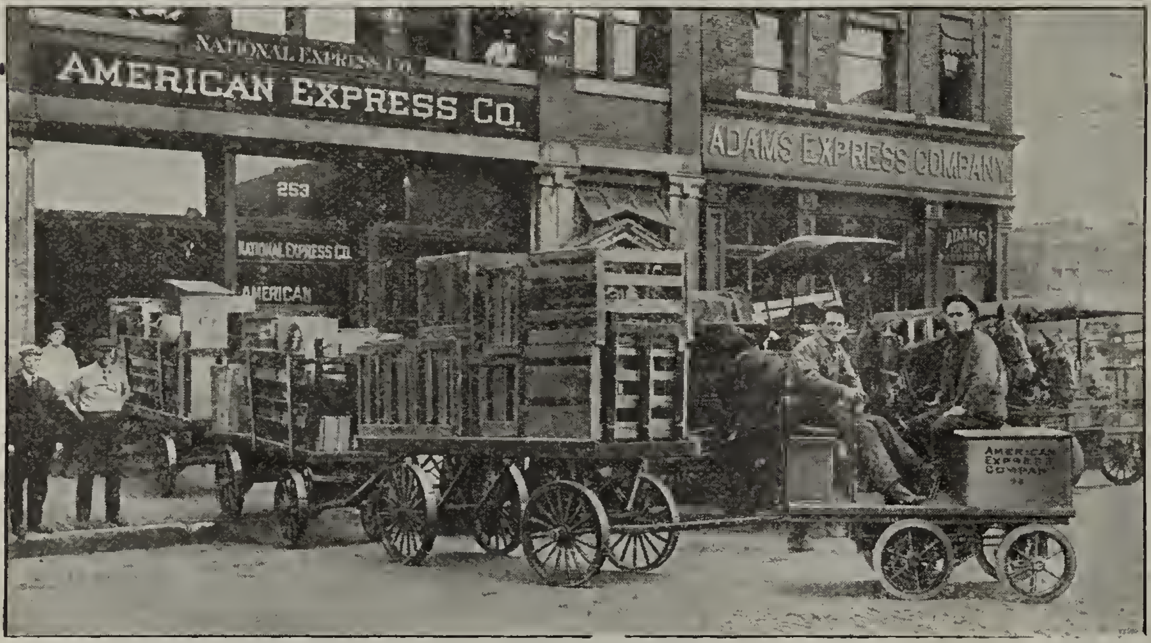
It will be noted that the large sprocket is bolted to the spokes of the drive wheels, thus giving maximum distribution of strain.

A feature of the tractor is the fool-proof control which renders it impossible to operate it other than correctly. The control will automatically shut off the power and set the brakes if the operator steps off or is thrown off the platform when the tractor is in motion.

The wheels are cast steel with Timken bearings and 20 inch solid rubber Goodrich tires.

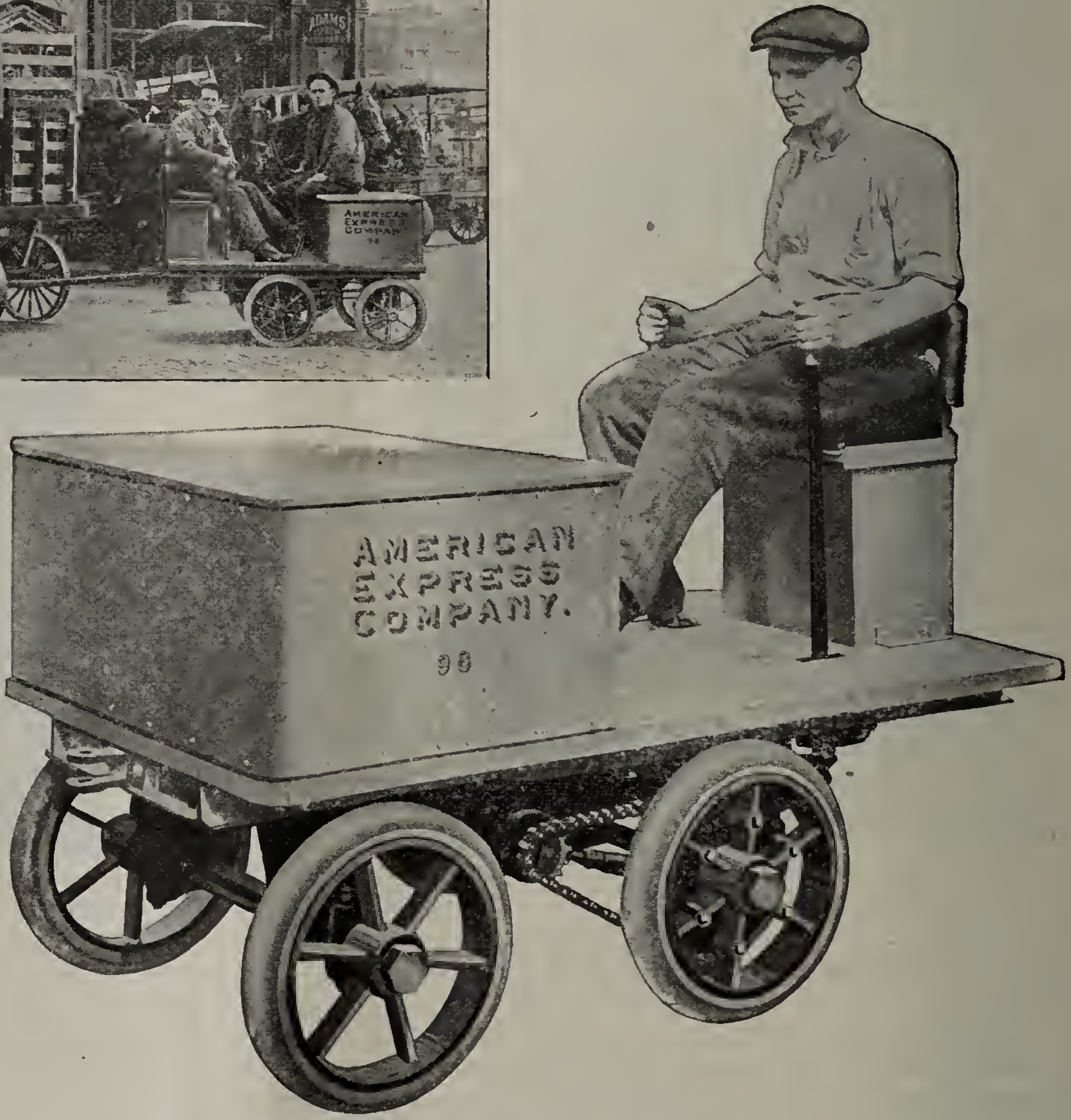
The motor and control are of the Wagner type, and current is supplied by Exide batteries.

This tractor may be used advantageously by manufacturers of brick, tile and sewer pipe in transferring products and supplies from one part of the plant to another. It is in use by many large plants in this way and has proven a great time saver and a great labor saver. Write for descriptive circular to the Orenstein-Arthur Koppel Company, Koppel, Pa. As will be seen by their ad on page 539 of this issue, they manufacture a full line of dump cars, transfer cars, portable track, steel ties, rails, frogs, switches, turntables, and in fact, a complete line of labor-saving hauling equipment for brick and tile plants.



Rapid Transfer of Baggage and Express Matter. A Great Time and Labor Saver

THE ELECTRIC TRACTOR

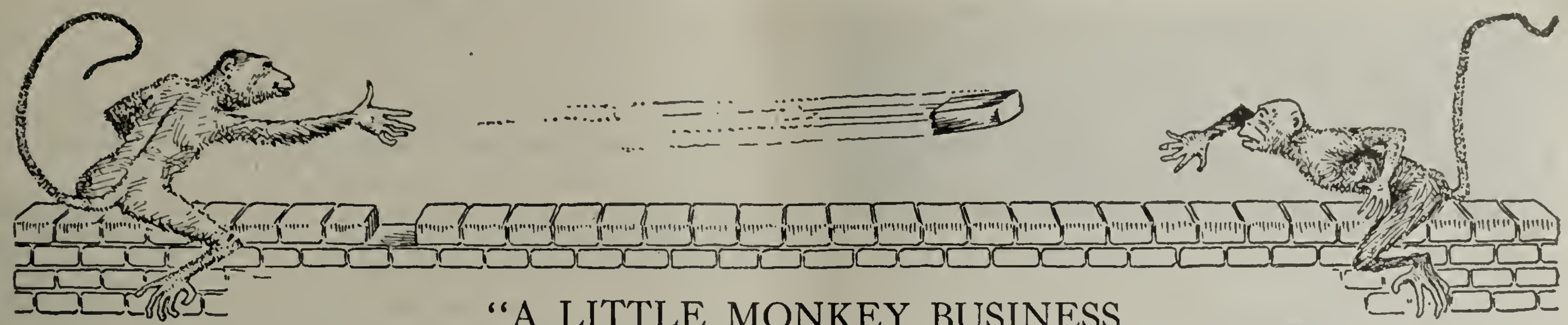


Constructed by The Orenstein-Arthur Koppel Company, Koppel, Pa.

AN OLD INDIANA BRICK CO. UNDER A NEW NAME.

Changes have been made in the affairs of the J. M. Leach Manufacturing Company, at Kokomo, Ind., whereby the brick and ice enterprises so long under one control will pass into separate management. The brick business will be in charge of Howard H. Leach and will be owned entirely by the Leach family, while the ice business will pass into the hands of Mark Brown and others. The brick business will be operated under the firm name of the Kokomo Brick Works.

Think of the free boosting of trade for the hoe and rake makers. If we could only get something to give a similar free boost to brick building we could all be happy.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

On the Square, It Is.

It is queer they allow an expression like "the four corners of the earth" to survive after all the pains our joggerfy teachers take to make us think the earth is round.

* * *

No Time for Words.

"What would you say if I should kiss you?"

"That's a foolish question to ask a girl."

"Why so?"

"Under such circumstances a girl seldom says anything. Some of them gurgle; others gasp."—Kansas City Journal.

* * *

Natural History.

"What are oxen?" asked the teacher. The little foreigners looked blank. "Does any one know what a cow is?" she asked, hopefully. A dingy hand waved wildly at the back of the room.

"I know, I know, teacher. A cow, she lays milk!"—Harper's Magazine.

* * *

Bit of Advice.

"Yes, we married in haste. I hope my husband doesn't repent at leisure."

"Demand pretty clothes and everything else you think a girl should have. Keep his nose to the grindstone. Don't let him have any leisure."—Louisville Courier-Journal.

* * *

Opportunity Missed.

A Denver man tells of one Westerner's opinion of the East. It appears that this man had occasion to visit New York, a city he had never seen. He remained for a week or two longer than he had expected, and, in writing of his experiences to his wife in the West, he said:

"New York is a great city, but I do wish I had come here before I was converted."—New York American.

* * *

"Pluck, Pluck, Pluck."

A man who had made a huge fortune was speaking a few words to a class at a business college. Of course, the main theme of his address was himself.

"All my success in life, all my financial prestige," he said, proudly, "I owe to one thing alone—pluck. Just take that for your motto—'Pluck, pluck, pluck!'" He made an impressive pause here, but the effect was ruined by one student, who asked impressively:

"Yes, sir , but please tell us how and whom did you pluck?"—Pittsburgh Chronicle-Telegraph.

* * *

Such Is Fame.

A Long Island teacher was recounting the story of Red Ridng Hood. After describing the woods and the wild animals that flourished therein, she added:

"Suddenly Red Riding Hood heard a great noise. She turned about, and what do you suppose she saw standing there, gazing at her and showing all its sharp, white teeth?"

"Teddy Roosevelt!" volunteered one of the boys.—New York Times.

In the Past Tense.

"When I die," said the husband, "I want you to have this sentence placed on my monument: 'There is peace and quiet in heaven.'"

"I think," rejoined the wife, "it would be more appropriate to say: 'There was peace and quiet in heaven.'"—Indianapolis Star.

* * *

Columbia's Plea.

"Kaiser, may I go out to sea?"
"Yes, my darling daughter.
Paint your flag on the stern of your ship,
But don't go near the water."
—New York World.

* * *

Not in the Running.

The Judge stopped to have a word with the colored man of all work, and asked if he went to church.

"Yessuh, Ah goes to church every Sunday," he said.

"Are you a member?"

"Yessuh."

"What church?"

"Prespeteeryn."

"Do you believe in the doctrine of election?"

"Yessuh."

"Do you believe I am elected to the saved?"

"Law, Judge, Ah didn' even know you was a candidate."—Argonaut.

* * *

Making a Fool of the Boss.

Murphy was taking a day off, and, wishing to enjoy himself thoroughly, he walked around to watch "the boys." He was surprised to see his friend Kelly working as if carrying a hodful of mortar up and down the ladder were the only thing he took any real pleasure in.

"It's yourself that's working highty hard today, Kelly!" expostulated Murphy.

"Whist! I'm just making a fool of the boss!" said Kelly, winking slyly.

"And how are you doing that, Kelly?"

"Sure, Murphy, it's as easy as kissing your hand! He sees me going up the ladder with my hod full of mortar, and he thinks I'm working. But, Murphy, my boy, it's the same hodful I'm carting up and down all the time!"—Youth's Companion.

* * *

His Only Invention.

Hubby—"I see Mr. Edison says four hours' sleep is enough for any man, and he is the greatest inventor in the world."

Wife—"Well, that doesn't justify you staying out half the night. The only great thing you ever do in that line is invent excuses."—Florida Times-Union.

* * *

About Even.

"You farmers buy a good many gold bricks, eh?"

"Yes, and you city fellers buy a good deal of swamp land. I guess things are about even."—Louisville Courier-Journal.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVII. APRIL, 1917. No. 4.

My Country, Right or Wrong—My Country!

CURRENT COMMENT.

Red, White and Blue are the favorite colors at this writing.

* * *

Being a king or an autocrat is not a very popular calling these days.

* * *

Hoe and rake exercises are just as much a part of the game today as military drills, and in their way fully as important.

* * *

Some of the demonstrations of what can be done by getting together locally are impressive enough to inspire effort at local organization in every brickmaking community.

* * *

When we look back over the progress of thirty years in brickmaking, and then turn attention to the art of brick laying, we have a spell of wondering why some things progress more than others.

* * *

Experience is a great teacher in any walk of life, and it plays a very large part in the education of a clayworker, because of the many and varying complexities involved in the raw material and local conditions. No one knows just what the lessons of experience are to cost, either, till they are over with and the day of reckoning arrives.

* * *

It is a good time for drain tile people to tell the farmers how they may grow bigger crops by draining the lowlands.

* * *

The only autocrat still secure in his power is the baseball umpire, and his goat is sometimes in danger from the rooters.

* * *

Progress in the mechanical handling of brick will be more than usually necessary this year, because of the scarcity of help.

* * *

The navy uses some fireclay products, and the metal industries a lot more, so there is plenty doing among the firebrick plants.

* * *

From the price of agricultural products, it looks like the farmers don't need the loan banks right now to get money for improvements.

* * *

Those realty men who are laying out new suburban additions should be told about brick as a good investment, both for home building and street paving.

* * *

The N. B. M. A. is now thirty-one years old and has nine healthy offsprings, as was pointed out by President Deckman in his annual address at the recent meeting.

* * *

Whenever there is a chance to reduce the cost of brick making by the application of modern methods, it is just as important to do this as it is to strive for the right kind of prices after the product is made.

* * *

One of our inspired modern oracles in assuring us that happiness is internal, not external, proclaims that it is not the things that lie about us that make us happy. Sure not. The "things" that lie about us often make us raving mad.

* * *

We frequently encounter incidents showing how the eyes of an architect find beauty in what is thought to be cull brick. So there are more ways than one for the trade to profit from a closer acquaintance with architects. Also there is value in any well burned brick.

* * *

The government business is plainly entitled to preference in the present crisis, but that fact does not provide cars for those who need them for ordinary freight movement. Somehow, it leaves us with a feeling that the railroads should have done more preparing the past two and a half years.

YOUR NEIGHBOR'S FIELD.

While the satisfying of the public demands for different shades and grades of brick make it essential for one brick man to ship at times into the territory of another, there is a limit to this kind of trade and there is something worthy of special study in the point made by an old brickmaker in the correspondence column of the convention number of the Clay-Worker. He said if an inquiry comes from a town where there is a brick plant, tell the inquirer that you make it a rule not to ship brick into a town where there is a brick plant because it would be necessary to cut the price to offset freight cost, and it would be doing an injury to the brick man in the territory, who has to pay taxes and has a plant which is a benefit to the community.

His suggestion was that copies of letters of this nature be sent to the local brick manufacturer. There is no question but what, if you respect the field of the other fellow, he will be moved in time to show similar respect for the field in your own surrounding territory, and in this way there can be effected a saving in freight by every man getting more of the trade in his own immediate territory. This will not only mean better profits, but it will save some of the congestion and worry about lack of transportation facilities.

Moreover, the best way to eliminate cut-throat competition, as well as the surest way to better profits and more satisfactory business, is to be friendly with your neighbors and take the matter up with them when an opportunity comes along tempting you to ship into his territory. Do unto the other fellow in this case as you would have him do unto you.

THE BEAUTY OF ILLUSION.

Many of us, after we reach what is termed the sage period or age in life, are given to remarking about the disillusionment that comes to people with more or less sarcasm, pointing toward the ignorance or an unripe condition of confidence in humanity that begets illusion.

The sarcasm should be for the disillusionment and not for the illusion, for without some of the beautiful illusions that many of us have, life would not only be dull, but it would be rather ugly. As George Eliot said: "Thank heaven, a little illusion is left us to enable us to be useful and agreeable."

Thanks also that we know not just exactly what our friends think of us, lest we be discouraged. Let us be glad the world is not made of looking-glass to show us just the sorry figure we are making when we think we are doing something good and beautiful—nor to show us what is going on behind our backs.

By the help of this kindly illusion we are able to dream that we are charming and thus smile as we go along. Also, we dream that others admire our talents and that we are doing much good in the world.

As a consequence, we do some good and receive some admiration—and a lot of pleasure that would disappear if it were not for illusions. So, let us not be too ready with our sarcasm when we speak of the disillusionment that comes with disappointment as we go through life.

THE BUSINESS OUTLOOK.

There was before the country what on its face appeared would be one of the biggest years on record in building operations. Then came the entry of this country into the great world's war, and now there is naturally some speculation as to what effect this may have on building operations.

One of the most encouraging things about it all is that our entry into the war created practically no immediate excitement or disturbance in business circles. There was on all hands a great display of patriotic fervor, but no closing of stock exchanges or any of the financial business panic and excitement which was a very distinct part of the original outbreak of the war in Europe. This was partly because we have become accustomed to war talk, and the entry of our country into it simply meant one more, but there is a cause even deeper than that. There is a feeling of confidence that the war cannot materially injure this country and that the entrance of this country into it will bring the end sooner, and insure proper peace terms, and very likely better conditions throughout the world even among the countries previously at war.

The first immediate effect is to turn a lot of our industrial energy toward the government needs in the way of freight movement, ship building and the supplying of mechanics and labor, and this hampers business a little and is making cars scarce, labor difficult to secure and higher prices in some materials and necessities of life.

This will very likely curtail building operations some as compared to what we might have expected, because much of the labor will be otherwise engaged and much money and energy will be turned to supply government needs which might have been directed toward improvements and new building operations.

So there is no doubt but what the war will curtail building operations a little for the time being, and in this way will reduce somewhat the immediate demand for brick. But it is doubtful if the demand will be reduced enough to materially affect the situation for several reasons. One is that the production will be limited by a scarcity of help; another is that there are orders in hand in many instances for practically all of the spring supply, and still another reason is confidence in the country generally that the war may end soon, and that we can then resume our normal course. There are some who even contend that being engaged in the war will not materially curtail domestic business because it brings higher prices and prosperity, and this in turn leads to new home building. The one thing certain about the whole outlook is that no one seems to feel pessimistic; there is some grumbling about food prices and high prices all around, but there is a general air of prosperity and such a general feeling of confidence all around that one feels like building operations will go ahead much as usual.

There will be some special building of factory and warehouses resulting directly from the requirements because we are entering into the war, and perhaps these extra requirements will offset whatever curtailment may take place in other building operations. Anyway, no one seems to feel blue over the outlook and the main cry is for help and for transportation facilities. So it is possible that we may have one of the biggest building years on record even if we are mixed up in a war.

THE LUMBER YARD AND THE BRICK TRADE.

There is enough of building brick and other clay products passes through the lumber yard and through the hands of the retail dealer in lumber to make a pretty good connection between brick making and lumber dealing. This fact has been pointed out from time to time for a good many years in the columns of the Clay-Worker, and it is referred to again now because this year gives promise of being the greatest year on record for the larger development of this trade connection.

Structural lumber has increased so much in price the past year that the yard men are not only buying smaller quantities of it, but they are realizing more sharply than ever before that the future means more brick and other building material and less lumber for the purely structural purposes, and that it is up to them to form larger and broader connections with the manufacturer of clay products so that they may be in a position to still handle the building material trade of their community. They realize that lumber is nothing near the exclusive factor that it once was in home building of the modest class, and that instead of simply carrying brick for chimney building and flue lining and sewer pipe and things of that kind, they must in the future carry a full line of brick for structural purposes and put themselves in a position to push this trade.

All this makes the present a very opportune time for the manufacturers of brick and tile and other clay products to develop this trade connection extensively. The increased cost on structural lumber is something like $5 per one thousand feet as compared with a year ago. Lumber is now at perhaps the highest record known. It may be that in the course of another year the high price will stimulate production to such an extent that there will be a reaction. However that may be, it is pretty generally conceded that there is not much chance for lower prices the first half of the building season, and it is the general concession of this fact by those in a position to know that makes the opening look mighty good for clay products. It is an excellent opportunity to develop a larger trade, and once the clay products are properly introduced they will be mighty apt to hold their ground, even though lumber may come down a little in price eventually. There is this good quality about building with brick: it is a permanent and satisfying material, and once the habit gets well started in a community it does not recede, but keeps spreading and growing. So, if the clay products people will bestir themselves and make good use of the present opening to get a bigger place in the lumber yard, they will not only be doing good business for the time being, but they will be paving the way to a permanently enlarged business in clay products. It is a trade that should interest the makers of common brick, face brick, terra cotta, roofing tile, sewer pipe, drain tile. It is a line of trade, too, that has always been worth cultivating, and this year the opportunity is too good to neglect, so let's get busy and make the most of it.

CANADA CLAY INTEREST EXTENDING.

Evidence is forthcoming from time to time that our neighbors in Canada are becoming more and more interested in the development of clay working industries and also in the advantages of building with brick for better and more permanent homes, and the use of drain tile in farming.

Among recent happenings showing this awakening interest is a report from Consul E. Verne Richardson, of Moncton, New Brunswick, who tells of the clay deposits of that region. They not only have clay deposits, but they have gas and oil for fuel and this, it is figured, markes an encouraging combination for the development of clay working industry in that part of Canada.

So far the reports say the demand for structural clay has been limited and no agricultural tile has been made in the district, which is taken to mean that the farmers have not yet come to realize all the advantages of under draining. There is one brick making plant in operation in the vicinity of Moncton, but they find so many opportunities that hope is expressed by a reviewer for the Department of Mines of the Dominion that more effort will be directed toward utilizing their clay deposits and arousing interest in burned clay products.

They feel that they can not only develop more industries in brick making but that there is also a field for drain tile to be cultivated and expanded wonderfully, and also a chance for roofing and floor tile as there are clays and shales available that will make this kind of product.

IN THE SPRING TIME.

Easter, which really marks the beginning of spring time for the larger section of the United States, is the morning of the new year day. At one time it was the real beginning of the new calendar year, and it is hailed now over quite a lot of the civilized world as the beginning of the flowering and growing season of the new year.

This year it comes rather early in our calendar year, which is taken usually to mean an early beginning of the spring and summer season, which this time promises to be a very active season for building operations notwithstanding all the excitement of war.

There is to be factory and public buildings, perhaps a fair share of city buildings generally, but the one outstanding feature that distinguishes the present season is the unusual prosperity in rural districts, and a plentiful supply of money among the farmers, which should presage an era of farm improvement including the use of drain tile for the land itself and brick for home building. It is the country trade possibilities which furnish one of the interesting features of the year and it is to be hoped the brick manufacturers will put forth a fair share of brick boosting effort during the season to the end that a fair start may be made toward developing the habit among farmers of building permanent homes with brick.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, ETC., required by the act of Congress of August 24, 1912, of THE CLAY-WORKER, published monthly at Indianapolis, Ind., for April 1, 1917.

State of Indiana, County of Marion, ss:

Before me, a notary public in and for the state and county aforesaid, personally appeared T. A. Randall, who, having been duly sworn according to law, deposes and says that he is the managing editor of The Clay-Worker, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, T. A. Randall & Co., Inc., Indianapolis, Ind.
Editor, Theodore A. Randall, Indianapolis, Ind.
Managing Editor, Theo A. Randall, Idnianapolis, Ind.
Business manager, Theodore A. Randall, Indianapolis, Ind.

Owners are T. A. Randall & Co., Inc., Indianapolis, Ind.; Theodore A. Randall, James E. Randall and Denton F. Billingsley, each and all of whom are at 211 Hudson St., Indianapolis, Ind.

Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: None.

That the two paragraphs next above, giving the names of the owners, stockholders, security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

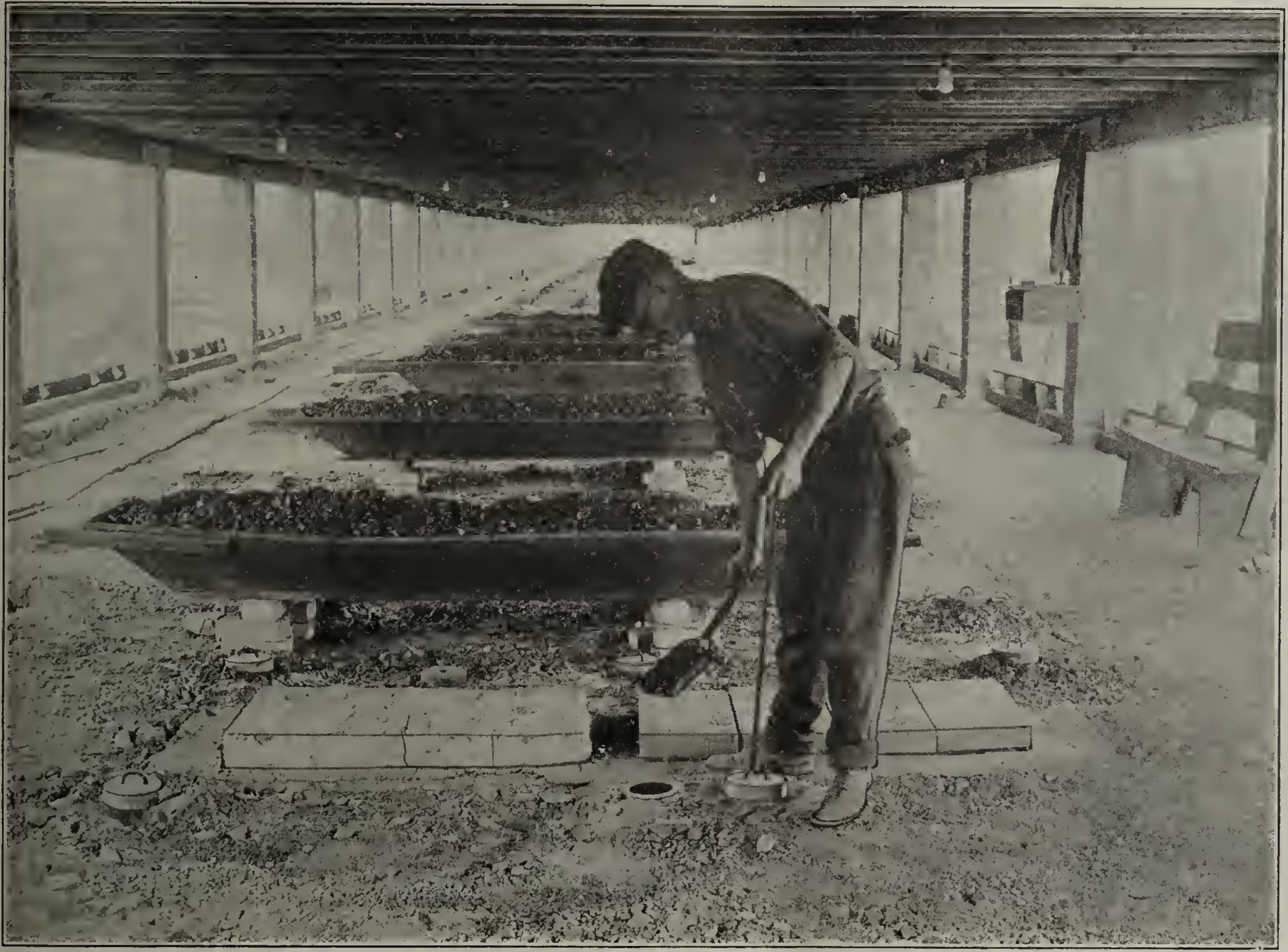
(Signed) Theo. A. Randall, Editor.

Sworn to and subscribed before me this 29th day of March, 1917. (Signed) W. P. Hanna, Notary Public.
[Seal] My commission expires April 4, 1920.

With the Haigh Kiln

he Haigh Continuous Kiln saves more than half the coal used in other types
iality. It places you in an advantageous position to compete—saves cost and

e Haigh Kiln in actual use. We have a series of photos showing the build-
ent of the excellently burned brick after completion of the kiln. Send for



is picture shows the top firing holes through which coal is fed into the kiln. The blocks are so set that the
l fed into the kiln can fall to the floor of the chamber. These firing holes are placed every 4 ft. lengthwise
d crosswise in the kiln. Only a small quantity of coal is used from the top as can be seen in the picture. The
erator lifts the fire hole cover with a hooked rod and with the other hand shovels in a small amount of slack or
e coal with a small shovel. Note the coal bunkers for holding the supply of coal.

The bunkers are moved along the top of the kiln as the fires advance. When the kiln is under full heat
coal is almost completely gasified before it reaches the bottom of the kiln.

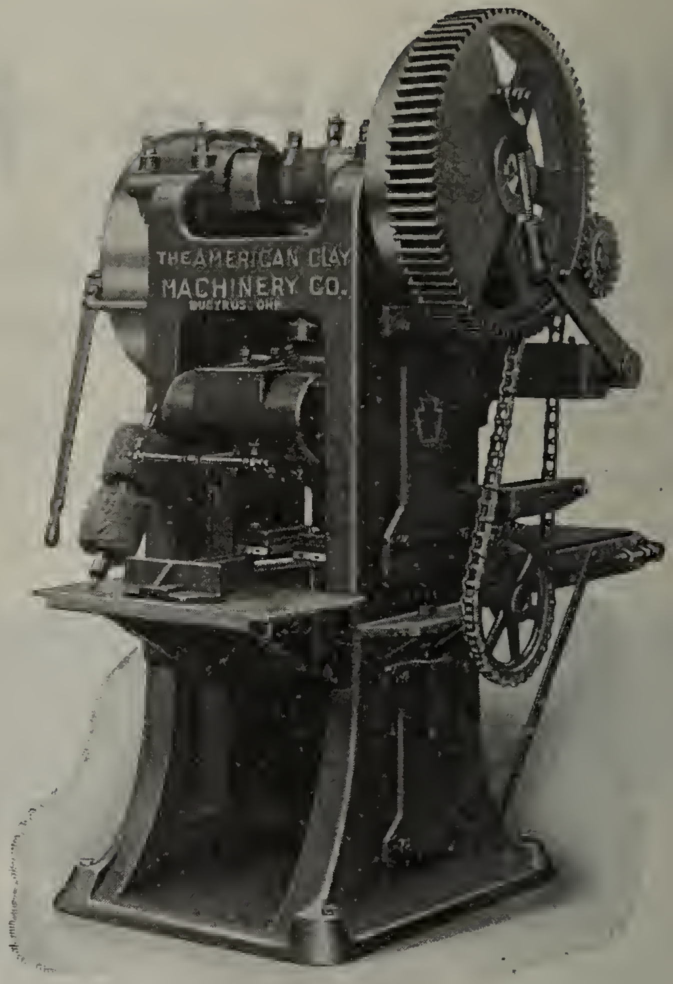
ucyrus, Ohio. **"More and Better Brick"**

Details of Quality

Here are some of the details of quality of the American No. 292 Repress. It combines quality of material with excellence of design and workmanship.

These combine to make a press that is simple, strong, durable, efficient and capable of great output with little or no loss of time and money on repairs.

We claim the American No. 292 Repress is the best on the market. Here is what the Burton Townsend Company, of Zanesville, Ohio says about this:



American 292 Repress

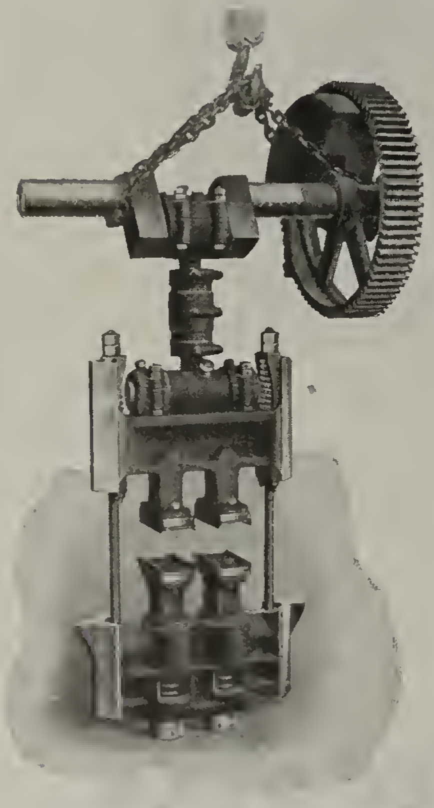
Main Frame of the American No. 292 Reprsss, Cast in One Piece

> "The Three American No. 292 Presses installed early in 1916 have been giving best possible service.
>
> "We have pressed 90,000 ten pound pavers in a single day. The kiln containing this run returned 93 5 per cent of No. 1 block.
>
> "We have had no trouble with these presses and are confident any manufacturer installing this 'Built Right Run Right' repress will get most satisfactory returns."

Let us send you a specification sheet on this repress. We build every machine or appliance you may need.

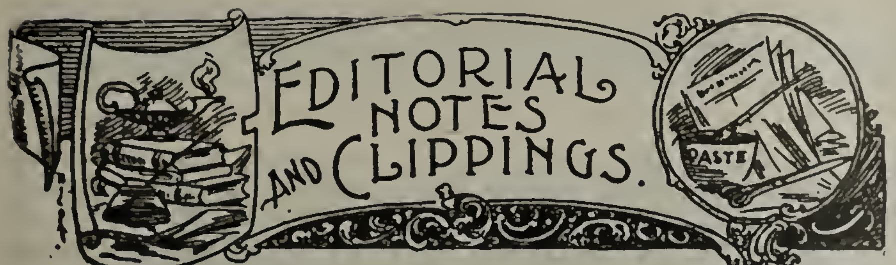
The American Clay Machinery Co.

Bucyrus, Ohio



Working Parts of the American No. 292 Repress, Located Inside of the Main Frame

Adjustable "V" Shaped Guides for the Crossheads. These Guides are Bolted to the Outside of the Main Frame. They Can Be Readily Removed or Adjusted to Take Up the Wear



EDITORIAL NOTES AND CLIPPINGS.

The Ashland Fire Brick Company has certified to an increase of stock from $200,000 to $400,000.

The Hallwood Brick and Tile Company, of Cincinnati, O., has been incorporated, with $10,000 capital stock.

The Hartford Brick and Sand Corporation of Wilmington, Del., has been incorporated with $300,000 capital stock.

The Troy Brick Company of Troy, N. Y., was slightly damaged by fire recently. The loss was covered by insurance.

The Palmico Brick and Tile Company, Washington, N. C., has been incorporated by W. D. Faucett, W. H. Lodge and others.

The Elliott Tile Company will erect a plant at Bismarck, N. Dak. W. J. Elliott, of Dickinson, N. Dak. is at the head of the enterprise.

The Oregon Brick and Tile Company, Beaverston, Ore., has just booked an order for 500,000 common brick for the postoffice at Portland.

The Illinois Fire Brick Company of La Salle, Ill., was recently incorporated by I. Stanley Filip, Joseph S. Samuels, T. Behr. The company is capitalized at $5,000.

The J. P. Hooper Construction Company, of Leaksville, N. C., has purchased twelve acres of land on which they will build a brick plant of 30,000 daily capacity.

The Far Better Brick and Tile Company, Wilmington, Del., has been incorporated with $20,000 capital stock. The incorporators are F. D. Buck, George W. Dillnan, M. L. Horty.

The Puritan Brick Company, at Hamden Junction, Ohio, will add new machinery to its equipment and erect new kilns. The company has increased its capitalization to $75,000.

Ezra Bucher has sold his interest in the brick plant of Martin & Bucher at Astoria, Ill., to Fred Keefer of Cantan, Ill., and the firm name will be changed to Martin & Keefer.

William Crume has been appointed receiver for the Trimple Paving Brick Company, Dayton, Ohio, on petition of James E. Conley, one of the stockholders of the company.

The New Ulm Brick and Tile Company's plant at New Ulm, Minn., is running to capacity. In addition to taking care of the local demand, the company is shipping to nearby towns.

The Atlantic Terra Cotta Company of New York City, has declared a regular quarterly dividend of 1 per cent. on the preferred stock, payable April 30 to stock of record April 19.

Aaron L. Jimerson, one of the pioneer brick manufacturers of the Hudson River section, died recently at the home of a daughter in North Plainfield, N. J. Mr. Jimerson was 85 years old.

The Harbison-Walker Refractories Company, Pittsburgh, Pa., declared the regularly quarterly dividend of 1½ per cent. on the preferred stock; payable April 20 to stockholders of record April 10.

The Neesman-Kenerly Brick and Lumber Company was recently incorporated at Salisbury, N. C., with $50,000 capital stock. Those interested are J. D. Kenerly, W. E. McWhirter and J. A. Neesman.

The Lehigh Brick Company, Allentown, Pa., recently organized with a capital of $250,000, has awarded contract for the erection of a plant. It will have an initial capacity of 50,000 brick per day.

Extensive improvements have been made at the plant of the Indiana Paving and Block Company, Brazil, Ind., and the plant reopened April first, after having been closed since December 1. The main offices of the company have recently been moved to Brazil from Indianapolis. Walter W. Winslow is general manager of the company.

The Portage Brick Company has been incorporated at South Bend, Ind., with $80,000 capital stock, to deal in builders' supplies. The directors of the company are: Horace M. Kauffman, G. A. Elliott, E. A. Morse.

Ed Berger is the new executive manager of the Davenport Brick and Tile Company of Davenport, Iowa. The plant of the company is located at Buffalo, Iowa, and is running almost exclusively on hollow building and silo block.

After being closed since last November, the plant of the Paducah Brick and Tile Company, at Paducah, Ky., was reopened April 2, and began the manufacture of tile. The plant was closed during the winter, as is customary.

The Pennsylvania Fire Brick Company of Lock Haven, Pa., has certified to an increase in the capital stock from $250,000 to $500,000. The additional funds to be raised will be used in the enlarging and extension of their brick plants.

James M. Esler, of Tarentum, Pa., has been appointed receiver for the Freeport Clay Products and Mineral Company, of Freeport, Pa. The company admits an indebtedness of approximately $225,000, exclusive of interest and costs.

The Okmulgee Brick Manufacturing Company, Okmulgee, Okla., has been incorporated with a capital stock of $40,000, by W. B. Pine, J. W. Hammond and G. W. Mabrey, and will buy brick presses and other clay-working machinery.

The Colburn-Murray Brick Company, of Minneapolis, Minn., has filed certificate changing the name of the company to the Colburn Brick and Tile Company. R. R. Colburn is president and H. W. Linder is secretary of the concern.

The Hermitage Brick and Tile Company of Nashville, Tenn., has been organized by E. T. Lewis, L. T. Lewis, O. H. Looney and others. The company is capitalized at $5,000 and will engage in the sale of brick, tile and other clay products.

C. W. Irwin, formerly manager of the Hydraulic Press Brick Company, at Minneapolis, has been appointed manager of the Hydraulic Company's plant at Davenport, Iowa, to succeed J. L. Buckley, who resigned some time since to take charge of the Capital City Clay Company, at Des Moines, Iowa.

The Edisto Brick Company, of Orangeburg, S. C., has been granted a charter to manufacture brick. The new concern is capitalized at $5,000, with the following officers: President, H. C. McGees; vice president, A. B. Bailey; secretary-treasurer, E. H. Blackmon.

The big No. 4 plant of the Soisson Brick Company, of Bolivar, Pa., was burned to the ground April 15. The plant had only been opened a few months ago, after having been closed down for some time. The company announces that the plant will at once be rebuilt.

When the Purington Brick Company of Galesburg (Ill.), opened their work for the summer April 2, they voluntarily gave all their employes an eight-hour day with the same pay which they received while working nine and ten hours. They will employ about 600 men.

The Continental Clay Products Company, of East St. Louis, Ill., has filed articles of incorporation. The company will manufacture brick and other clay products. The incorporators are, John Keeley, H. H. Lamar, T. J. Canavan, J. K. Walton and R. E. Gillespie.

No superintendent will be named for the State Brick Plant at Junction City, Ohio, which has been in operation with prison labor until the price of coal recedes materially from its present price. This announcement was made shortly after the resignation of Mason Chilcote, who was superintendent of the plant ever since it had been started four years ago. About 150 of the prisoners have been returned to the state prison, just enough being kept to guard the property and keep the machinery in condition. The lease of the property on which the plant is located will expire within a few weeks, and there is some question with the board of administration as to whether it will be renewed.

The Standard Brick Company, of Macon, Ga., of which W. E. Dunwody, one of the livest wires in the brick business is manager, recently landed the contract for the brick for the immense terminal station at Jacksonville, Fla., which is to be erected at a cost of $1,500,000.

There was an interesting flag raising ceremony at the plant of the Decatur Brick Company, April 6. The flag was purchased by the employes and the flagpole by the company. About 300 people were present and witnessed the exercises, which were appropriate to the occasion.

The Lehigh Sewer and Tile Company of Lehigh, Ia., was recently granted a temporary injunction restraining the striking employes from trespassing on the company's property. It is thought the end of the strike is in view and that the company will soon be running under normal conditions.

F. I. Mahuren, of Columbus, Ohio, has moved to Sharon, Ohio, where he will be assistant manager of the Sharon Clay Products Company, having charge of the manufacturing end of the plant. Mr. Mahuren is a graduate of the Ohio State University and has held responsible positions with other brick concerns.

The Keota Brick and Tile Company at Keota, Iowa, is making a number of improvements in its plant including the erection of an additional kiln and a new drying shed. Mr. McMillan, the general manager of the company, states that the improvements will increase the capacity of the plant about 25 per cent.

The official opening of the Warrenton Clay Company's plant, at Warrenton, Ore., occurred April 7, when the machinery was set in motion by Governor Withycombe. Shortly after, a banquet was served to a number of invited guests, including members of civic and commercial bodies of Warrenton and nearby towns.

The works of the North Dakota Pressed Brick Company, Dickinson, N. D., has opened with a full crew of men, working both day and night shifts. The company has a number of large rush orders of both brick and tile, which must be filled at an early date, and as a consequence the plant be worked to capacity throughout the entire season.

The plant of the Abingdon (Ill.) Clay Company, manufacturers of hollow building tile, was totally destroyed by fire recently. The only thing left is the brick constructed kilns and stacks. The loss is between $15,000 and $20,000, only partially covered by insurance. The company is planning to rebuild the plant on a much larger scale.

Geo. C. White, of Wadsworth, O., has resigned his position with the Wadsworth Brick Company, to become general manager of the new concern at Mansfield, O., known as the North American Brick and Clay Products Company. Mr. White is a brick man of many years' experience, and will have entire charge of the construction of the new Mansfield plant.

The West Point Brick and Tile Company of West Point, Neb., has been organized and the following officers elected: W. T. S. Neligh, president; A. L. Krause, vice president; Henry Bauman, treasurer; E. M. Vonseggern, secretary. The company will develop the extensive beds of clay lying north of that city and a plant will be erected in the near future.

It has not been the lot of very many men to have their neck broken and live, but Porter C. Farris, superintendent of the Hydraulic Press Brick Company's plant at Brazil, Ind., enjoys(?) that distinction. While cranking his auto, Mr. Farris gave his neck a sudden wrench, causing him a great deal of pain. After suffering for several days the local physician took him to a specialist in Indianapolis, where it was found that the sixth vertabrae had been fractured. His neck was at once put in a cast which he will wear until the bones knit, when the physicians assure him he will be as good as new.

A new $225,000 industry, incorporated under the name, Hoosier Clay Products Company, has been organized at Montezuma, Ind. Work will be started on the erection of the plant next month. It will be located just across the Wabash River on 113 acres of ground recently purchased. D. S. Strong, of Dana, with R. W. Sutton, of Montezuma, and E. E. Asbury, of Newport, are officials of the company.

The plant of the Atlantic Brick Manufacturing Company at Mays Landing, N. J., was reopened the first of April after having been closed during the winter season. George J. Meyers is superintendent of the plant, which from present indications will be operated full time throughout the season, as the company has a large number of orders on the books now that will keep them busy for some time to come.

I. W. Brown of Hillsboro, Ill., has purchased the interest of Fred Mitchell in the Oland Brick and Tile Works at Witt, Ill. The name of the concern has been changed to the Witt Brick and Tile Company. Mr. Brown will assume the management of the concern, and have the plant, which will be operated on a larger scale than heretofore, generally overhauled and repaired.

The Portsmouth Refractories Company, Firebrick, Ohio, of which W. L. Hitchcock is president, will build a new firebrick plant in East Portsmouth, according to an announcement made recently by Ben Hitchcock, superintendent. The new plant will employ about one hundred men and will have a capacity of about 45,000 finished brick a day. It will cost about $75,000.

The Great Falls Brick & Tile Company has recently been organized to take over the properties of the Great Falls Sewer Pipe and Fire Proofing Company at Great Falls, Mont. The new company is capitalized at $200,000 and will at once make a number of improvements in the plant preparatory to starting same for the summer's run. The incorporators are S. S. Hobson, Frank W. Mitchell and Ransom Cooper.

The Tennessee Agricultural Lime and Brick Company has been organized and a plant will be built at Newport, Tenn., which will have a daily capacity of 200,000 brick and 75,000 four-inch drain tile. The officers of the company are Henry F. Gau, of Cincinnati, president; H. F. Rutzler, Jr., Atlanta, Ga., vice president; Howard Gau, of Cincinnati, secretary-manger, and Ivo Howard, of Louisville, Ky., treasurer.

The manufacture of drain tile, hollow building blocks, silo blocks, tapestry brick, paving brick and flue lining, is to be added to the business of the Sheridan Press Brick and Tile Company, Sheridan, Wyo. The new lines will be in operation, it is expected, early in the summer. The expansion of business was authorized at the last meeting of directors of the company and orders for the necessary machinery placed immediately.

Ward B. Edwards, editor of "The Mantel, Tile and Grate Monthly," published at Utica, N. Y., was recently highly honored by being elected president of the New York State Association of Child Welfare Boards. Mr. Edwards has been chairman of the Oneida County Board of Child Welfare since its organization two years ago and has devoted considerable time and study to the subject of widows' pensions. The many friends of Mr. Edwards in the publishing field will congratulate him heartily on the honor bestowed on him. The position is a responsible one.

Second Street, looking East from Elm Street, Fort Madison, Iowa. Brick pavement filled with Barrett's Paving Pitch.

Barrett's PAVING PITCH

Every brick can stretch itself

PAVING bricks are bound to expand in hot summer weather. It would be convenient if the bricks would stay the same size the year around, but they won't. On hot days they are bigger than they are on cold days. Engineers sometimes try to ignore the laws of nature in this regard and lay brick pavements with a filler of cement. Cement has very little sympathy with the desire of brick to expand and tries to repress the process. In consequence, strains and stresses are set up, causing all kinds of trouble, such as explosions, upheavals, thrusting of the curb out of line, thrusting of manholes out of position, damaging street railway tracks, pulverizing individual bricks, etc.

In an endeavor to compromise with this difficulty, engineers lay expansion joints at intervals in the pavement; but these expansion joints, filled with a plastic filler, are in themselves troublesome, for they must necessarily be of a considerable width, in consequence of which the brick at the expansion joint, unprotected at the edges, crumbles away and in time big grooves appear across the pavement.

The right way is to give to each brick its share of elbow-room by making every joint an expansion joint. This is what Barrett's Paving Pitch does. A crack, a bulge or a thrust is impossible in a pitch-filled pavement. In hot weather when the bricks expand, the joints grow a little narrower and the pitch in the joints is squeezed a little higher, that is all, and no harm is done.

Being inherently waterproof, Paving Pitch provides a perfect waterproof seal that will stay intact as long as the pavement lasts. A pitch-filled pavement can be opened to traffic immediately—no waiting for cement to set.

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By The Light of the Kiln Fire

THE COLONEL ON MODERN IDEAS.

THE COLONEL NOT ONLY had a satisfied smile, but he had a perky air about him that suggested a fancy picture of "after taking" some spring tonic and reviving one's youth. That he was in a good humor with himself and all the world went without saying, but just what had generated this pleasing state of affairs was the puzzle, and the first guess at it was put in the form of this question:

"Did you pick the Derby winner, Colonel?"

His feet came down from the elevated position and he looked serious for just a moment, then laughed and said:

"No, suh; I didn't pick the Derby winner; and if I had, I am too old a man at such things to show childish glee over it. Indeed, I would be likely to look serious, because an old sportsman never shows hilarity over such a thing as that.

"The fact of the matter, suh, is that I feel tickled with myself to know that I can see, understand, and appreciate lots of the modern ideas and improvements. There are periods when I don't take kindly to such things, and then I begin to feel old and out of place; but when I can enter into the spirit right I feel like I am not a back number, and that helps me renew my youth."

"What is it this time, Colonel?" I inquired. "Have you fell in love with the new betting machines that take the place of the old book makers?"

"No, suh," he replied; "I don't know that I have. Yet I can recognize and appreciate certain forms of improvement in them and that's an example in case. They may not have all the noise and flavor of the old-time bookie, but there is less trickery and more absolute honesty about them and the business had reached a point where it became necessary to have something of that kind. However, it wasn't that I was thinking about."

Hazarding another guess, I inquired if he had discovered some of the newly rectified whisky, made old in a few days and flavored chemically so as to deceive even a Colonel and had in the end proved to be just as good in mint julip as if it had been aged and flavored in charred oak barrels.

"Wrong again, suh; wrong again, young man," the Colonel replied. "But that is another case in point. I have come to appreciate the fact that if you can make bourbon in a few days that looks as good, smells as good and tastes as good as the old-time bourbon that it took us years to age, blame it, it is just as good; and instead of fussing about it, we ought to appreciate the fact that in case our supply runs out we will not have to wait years to get some more in proper condition. It is one of the marks of progress that when a man doesn't appreciate in a proper spirit it is a sign he is losing step and getting to be a back number.

"What I was thinking about, young man, when you came up was the brick business and some new ideas in the industrial world, and as another new thought it is probable that there was some form of mental suggestion that put me to thinking about it when you were on your way to visit me."

"Well," I replied, "if you've got some new idea about the brick business that makes you smile and look happy, that is the very thing I am looking for."

"Well, suh, it is like this," he said. "I have just been reading about the new industrial idea of profit sharing, and at first, suh, I was frankly disgusted, because we thrashed that all out years ago and found it too highly ideal and short winded in practice. It was like running a pet dog against an old fox hound, to put it along side of our regular way of doing business. But, as I read further and got to thinking about it I saw that this was an old idea being brought up in a new form, and the new form made me think about what a man can do sometimes when he takes a line of old run-down stock and by proper breeding and training strikes a new strain that is better than anything that ever happened before, and that is what it looks like they are doing with this new profit-sharing idea.

"To begin with, the old idea covered too much territory and involved a scheme of making an industry a sort of paternal institution in which everybody shared in its profits. It undertook to cover too much. There were too many drones in the family, and unscrupulous ones. Now, however, the idea is to select those who are to share in the profits. Make the division among a select few and put those few in a position where they can do the most good.

"To apply the idea in the brick business, let us take the matter of superintendents and foremen. I don't know, suh, whether you are old enough to remember it or not, but the problem of the superintendent used to be a mighty serious thing with the brick business, and many a time the more a man sought to encourage the superintendent and give him room to expand, the more it cost him in the end, because the superintendent unconsciously got a sort of notion into his head that he was conducting a show, or showing how many different kinds of new schemes he could inaugurate and new ideas he could carry out. And he was frequently so wrapped up in these things that the thought of immediate profit was a secondary consideration. There was so much time and money given over to inaugurating new systems and installing new equipment that there was neither time nor money left to make a profit with.

"Now, then, with things like this happening in the past, it might seem at first that here is the same trouble coming up again in new form, and I confess to you, suh, that at first that is the way I looked at it; but suddenly I got a new light and that is why you caught me smiling. In the early days the superintendent or foreman was inspired to do things which made a show and would get him a bigger salary.

"Now, if we eliminate this desire for show and put in its place a chance for a share in the profits—say set aside a certain per cent. for the profits to be divided among the office managers, superintendents and foremen, and center the men's attention on this point, then instead of being carried away with ideas of putting in this equipment and that equipment just because it looms up big and shows progress, they will, if they are the right kind of stuff, get their minds centered on that bunch of money they are to get at the end of the year in the way of a profit dividend, and they will figure both ways on whatever new installment of machinery or change they make in the works.

"And that is only half of it. Properly inspired in this way, the superintendent and the foreman will become more alive and wide awake and will one way and another keep their men keyed up to a higher pitch and stir things up much better generally than they will if all they have to look forward to is their salary and the show they can make in carrying on their work.

"So, you just pass the idea along to the boys and tell them there is a new wrinkle in that profit-sharing idea than can be fitted in very well if they get ahold of it right, and also tell them that if an old codger, like me, can see and appreciate the points in modern ideas instead of falling behind the procession and letting the young men stay in the lead, there are some others that might catch the same viewpoint and get more both of pleasure and profit out of their business."

There has never been a time when labor saving devices were more essential to the clay-working industry than now with labor scarce, hard to get and high in price.

While you are pondering and debating with yourself as to whether you should do it or not, the other fellow is installing the

Underwood Producer Gas Burning System

(PATENTED)

and has paved the way for getting the fullest measure of efficiency in the operation of the truly important feature of his business. Why don't you assume this progressive spirit and at least investigate what this system will do for you? It doesn't cost you anything to be convinced, but your burning is costing you excessively all the while you remain in the ranks of the unprogressive. Don't stand in your own light.

IF it is worth anything at all to you, as it surely must be—

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This conversion, which can be done to any direct heat type of Dryer, involves only an insignificant investment when done in our efficient way and will give you maximum returns.

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THE CERAMIST'S CORNER

(Continued From Page 399.)

Reduction During Salting Period and Its Effects. In the fire clay districts, where the clay naturally burns to a light buff color, it is the common custom to thoroughly smoke or reduce the surface of the ware in order to obtain the dark color demanded by the trade. In shale ware this is not necessary, as the material burns to a red color naturally. Moreover, reduction in shale gives the ware a highly metallic luster and black color which is very undesirable. But as I have said before, fire clay is being smoked to a large extent for the color. The result of this action is far-reaching on the quality of the ware, and has given rise to a number of defects which in many cases make the ware almost unmarketable. The first consequence of this custom is the fuel waste. In order to insure reducing conditions, the burners lower the dampers, close the fires up tight, and fire at long intervals. This keeps the kiln full of smoke, which may be observed pouring from the stack at any time. This is naturally a very wasteful procedure from a fuel standpoint as the biggest percentage of the fuel added is being lost at the stack.

The second result I wish to call attention to, is not noticed until after the pipe have been exposed to the weather for awhile. After the atmospheric conditions have worked their will on the stock pile for a few months, these pipe commence to craze, showing faint hair-like cracks all over the surface of the ware. This is never found in a pipe unless the surface has been subjected to severe reducing conditions. The action involved is probably a weakening of the body by the change of the iron from the "ferric" to the "ferrous" stage.

The third and by far the most important effect is the resulting roughness. Roughness is prevalent to a large extent in the fire clay districts, and to a less extent in the shale district. The roughness I am now referring to is that most commonly called ironing or iron spots. In spite of the fact that shale is supposedly not subject to reduction, roughness is quite common.

The usual explanation for ironing is based on the assumption that the reducing action of the gases of combustion brings these to the surface. In order to get at the truth of the matter, and determine just when this roughness occurs, a few simple experiments were made. Ware was set in different parts of a kiln in such a fashion that no glaze could penetrate. Also ware was set which was continually bathed by the salt fumes. When the ware was drawn it was found that the unglazed material was perfectly smooth and the glaze ware was quite rough. It was decided from this that roughness did not show up until the salting period. In order to verify this, an entire kiln of ware was heated up until ready to be salted and finished, and then allowed to cool without any salt being added. On opening the kiln, it was found that the ware was free from any iron spots. This same kiln was then closed again and rapidly fired and salted. When drawn, the ware was just as rough as usual. It left no reasonable doubt but that the iron spots are brought to the surface during the salting of the ware and not before. Hence we can reduce or oxidize as much as we please previous to this period but, during salting oxidizing conditions must be obtained.

Color without Reduction: Since the trade demands colored ware, it behooves us to obtain it in the fire clay districts. However, as I have just pointed out, reduction must be avoided as much as possible, especially during salting.

In this respect I wish to state that I have obtained splendid coloring without the aid of excessive smoking. During the heat raising period it is often quite a problem to keep conditions oxidizing due to extremely heavy firing. Hence it is quite easy to obtain a thin coat of smoke in the ware at a single firing. This in turn can be easily drawn out again by opening of the fires for a short period. Then another skin of smoke can be allowed to penetrate the ware. This is again burned out by opening the fires. This is commonly called flashing in the fire-clay face-brick districts, and is their usual method for obtaining flashed shades. The alternate reducing and oxidizing leaves the iron on the surface in a reddish color. Now, when the salt is applied, bright oxidizing fires may be used, and the cherry red coloration will be obtained.

Salting. I have stated that much of the roughness encountered in burning is due to reducing conditions set up during salting. The following scheme of salting was used with the primary object of creating oxidizing conditions. I have since found that exceptional glaze can be obtained in many cases where glazing was difficult before.

To begin with, the ware must be burned fairly hard before salting is considered. After the trials show up reasonably hard, the kiln fires must be prepared for salting as follows:— The fire holes must be thoroughly cleaned, the wisest plan being to clean alternate fire holes and thus eliminate excessive amounts of green fuel and the resulting heavy smoke. After the fires are clean, a light salt fire is placed close to the mouth of the fire hole, and a small air space is allowed over the top of the fire. This is in the case of dead bottom furnaces, but where horizontal bars are used it is best to leave the door open just a trifle. This may not be the most economical way of firing, but it insures a sufficient supply of oxygen which is what is desired. The fire is allowed to burn until the green coal is aflame and the volatile matter is expelled. This ordinarily requires about 15 to 20 minutes with long flamed coal, and a little less with short flamed coal. At this stage the fires are at their greatest intensity. The salt is now applied, a small scoop should be used, and a small amount of salt spread evenly over the fire. Great care should be used that only a limited amount of salt be used to an application, for reasons which I will discuss. In the case of dead bottom fire holes the furnace hole should be immediately closed up with a small scoopful of coal. With straight grates, all that is necessary is to close the door. A period of about ten minutes or so is now allowed until the salt decrepitates completely, and then another round is applied as stated, followed by a small amount of coal or the closing of the fire door. When the third round has been applied, and the salt burned, another light fire is put on. Allowing time for the volatile matter to be driven off, three more rounds are applied. Trials can be drawn every three rounds to determine the progress of the glazing period. The fires should be shaken or given a light clean after every three applications. Six rounds administered in this fashion, should be sufficient to develop a good glaze in most cases. Clays difficult to glaze may require three additional rounds applied after the method already outlined.

Considering the operation outlined step by step, we find that first the trial must be reasonably hard. This is well understood by most burners; but in the use of haphazard methods of salting, kilns are very often overburned, due to the burner waiting too long before starting the salt application. Using the method as outlined it is possible to start earlier in the game, before vitrification has even started. As the salting progresses, the ware continues to harden, since the salt fumes have a fluxing action. By drawing trials after every three rounds, it is possible to keep complete control of the salting; and when the trials finally show hard enough and glazed enough, salting may be discontinued. By thus starting the salting early, and hardening the ware gradually during the salting, it is possible to lessen the chances for overburned kilns.

Cleaning of Fires: Most practical burners clean fires as a preliminary measure to the salting process, but they never go beyond that, and consequently lose the benefit of the preliminary work. By cleaning the fires before salting, we bring them to a high heat, and by keeping the fires bright and un-

(Continued on Page 540.)

Dryer Cars

V-Shape Dump Cars

The Electromobile Emptying Kiln in one instance actually showed saving of $4,320 per year.

KOPPEL

LABOR SAVING
Hauling Equipment
For Brick Plants

Wherever there's hauling to be done — from shale bed to shale room—from cutting machine to drying room—from drying room to kiln and from kiln to freight car, Koppel equipment can be used effectively to reduce costs and save labor.

There are **Rocker Cars** to transport the shale to the shale room and **Dryer and Transfer Cars** to haul the brick from the cutting machine or press to the kiln. There's **Portable Track** for use in the shale bed. **Steel Ties, Rails, Frogs** and **Switches** to build the line and **Cast Plate Track** and **Turntables** for use inside the plant.

Then there's the wonderful

THE
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INDUSTRIAL TRUCK

for emptying kilns. One man with this truck can do the work of five or six wheelers and it soon pays for itself.

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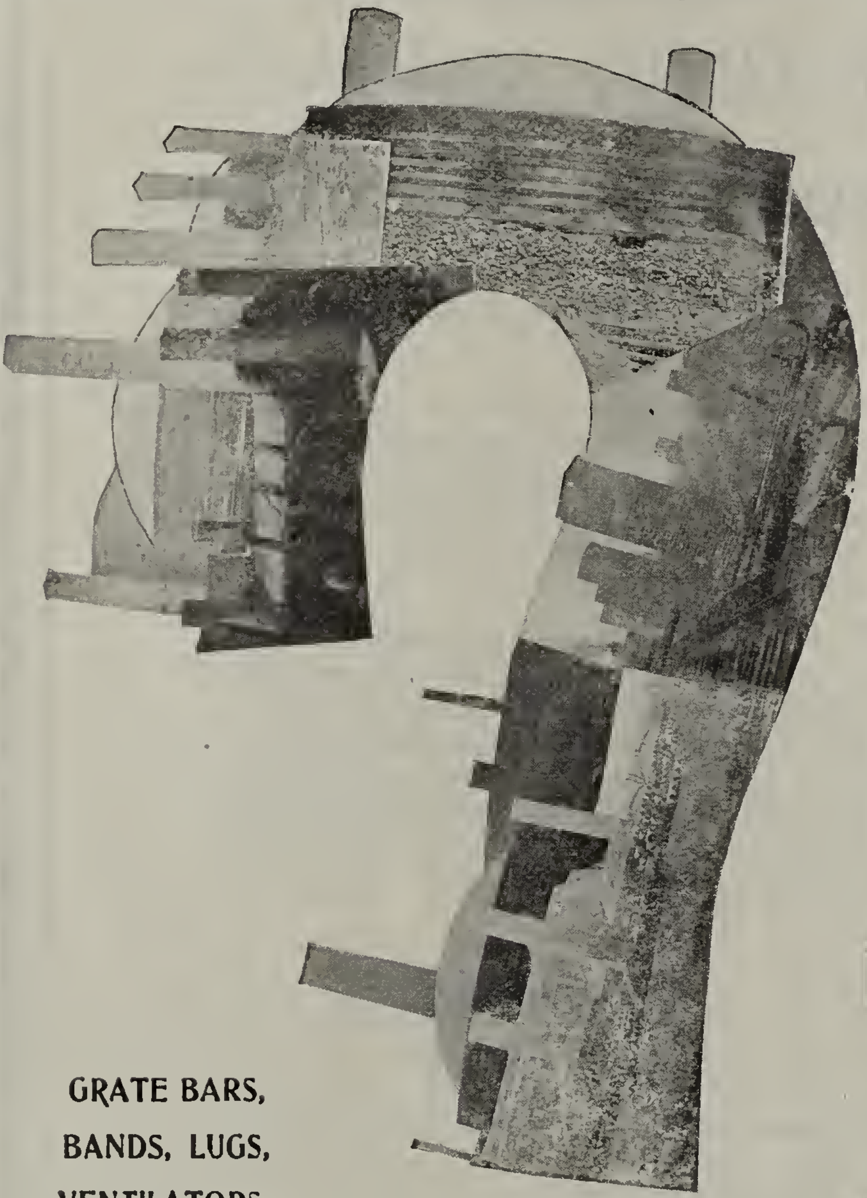

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Equally efficient in round, square or rectangular kilns, single or multiple stack type. New Hook Kilns cost less, as a rule, than kilns of other styles. Old kilns can be changed to our type at comparatively small expense. Give us number and size of your kilns, kind of ware, burning time and fuel consumption. We will estimate cost of installation and saving that can be effected.

HOOK PATENT KILN CO.
High and Spring Streets
COLUMBUS, OHIO

THE CERAMIST'S CORNER

(Continued From Page 538.)

clogged, we permit free oxygen to enter, thus furnishing good combustion conditions and making the kiln atmosphere oxidizing. The fires must be stirred up and kept bright continuously in order to insure these conditions.

Salt Application: As stated 15 minutes must pass before salt is applied. This gives the fires an opportunity to attain their maximum temperature. Also the volatile matter of the coal has, to a large extent, been expelled and conditions in the kiln have become more oxidizing. Furthermore, on the application of each fire, there is always a slight scum of smoke on the surface of the ware which gathered while the volatile matter bathes the ware. This burns off immediately after the volatile matter is expelled, and the oxygen has a chance to get in its work. If the salt is applied before this scum is burned off, a rough product is ordinarily obtained, and in shale districts, a metallic black color results.

The salt is applied in small amounts and is well spread, because larger amounts will deaden the fires and remain unburned.

Coal is added in small amounts after each application of salt in order to keep the heat in the kiln to a maximum. The action of salt glazing is an endothermic one (heat absorbing), and it is necessary to add a little fresh fuel with each charge of salt in order to keep the kiln temperature uniform. A little fuel closes the mouth of the fire hole, where dead bottom grates are used, and cuts off the flow of cold air over the fire. Cold air should never be admitted over the fire except in cases where a kiln has extremely poor draft and conditions are very reducing. The admission of cold air over the fire bed has the effect of reducing its temperature, and thus cutting down its efficiency so far as decrepitating the salt is concerned. For best results, all air must be admitted through the fuel bed, and not over it.

The application of three rounds is not arbitrary. I have found by experiment, that three small rounds applied as stated is about as much as an ordinary salt fire can take care of efficiency. By the time a fourth round is to be applied, the fires have lost their brilliancy. On the other hand, if only two rounds are used, we do not get the most out of our fuel, and there is always an opportunity of over-burned ware due to the use of fuel to excess. After the third round has been applied, a small salt fire is used, which brings the fuel bed back to its original heat intensity.

Cleaning and stirring of the fires continually is necessary during the operation. It will be noted in this regard, that the salt to a certain extent melts and combines with the mineral matter of the coal ash to form a soft glassy slag which runs down through the fuel bed or grates as the case may be, hardens as soon as the cool air strikes it, and prevents the air from entering. Hence it is of vital importance that the bed be shaken, enough to break up this formation.

If the above method be followed and care taken, roughness can to a large extent be eliminated, and moreover an exceptionally bright salt glaze can be developed. Complete control of the glazing is possible at all times, and by the three round periods it is possible to salt until a good glaze is obtained.

As already stated, good color in the fire clay districts can be obtained without the excessive smoking, but the preliminary flash must be administered first.

Before leaving this subject I wish to state that at all times it is necessary to have a good draft during this operation. If a damper is used, it should be raised pretty well, thus taking the fumes rapidly through the kiln, and ensuring maximum oxidizing conditions.

Salt Scumming: It happens quite often that after a kiln is finished, and the ware drawn, that a white scum shows on the ware after it has been in the open a short time. This is due to excess salt fumes, in the kiln atmosphere, which had not been drawn off at the stack, but were redeposited on the ware. As a matter of course, the first heavy rain will remove this from the surface of the ware; but to the uninitiated, this often appears a serious defect, and may result in a loss of business. In order to eliminate this scum, a light fire should be applied after the salting has been completed, and most of the salt has decrepitated. At the same time the stack damper should be raised high. The added fire will have a tendency to burn up what salt may remain in the fire holes, while the increased draft will draw the fumes from the kiln. The small fire will not affect the ware, if it is not applied until the kiln has evidently started cooling. Scumming of this nature can be eliminated completely, in this way.

Written for THE CLAY-WORKER.

PACIFIC NORTHWEST CLAY NOTES.

THE general situation among the clayworkers of the Pacific Northwest is better than it has been for the last two years. Business is slowly increasing and new building is forging ahead in good shape. The main drawback is that the larger cities are overdone with building, and those clayworkers who have their plants close to large cities do not feel the effects as much as the smaller plants distributed in the country. With lumber at much higher prices than years ago and with clay products still at the old prices, clay products are apt to be used more. It is gratifying, however, to know that there is some combined effort at work to raise the prices of all clay products on the Pacific Northwest in view of the fact that everything that the brick and tile maker is using, is now so much higher than it used to be.

The California Section of the American Institute of Architects is conducting a competition for the best design of a brick house and the Brick & Tile Delivery Co., of Seattle, has added a $50.00 prize to the best design submitted by any architect or draftsman from the state of Washington.

One of the largest stacks in the world will be built by the Anaconda Copper Co., at Anaconda, Mont., at their new Washoe smelter. It will be 535 feet high and 50 feet in diameter, and will take 30 million brick. The company will make their own brick at their plant in Anaconda.

Mr. B. L. Tracy, of the Arago Brick & Tile Co., of Arago, Ore., has just installed a new downdraft kiln, and reports business very good. The draintile business in his section is steadily improving and the demand for brick is good.

The Granger Clay Products Co., of Granger, Wash., which was incorporated last month, will erect a new plant at Granger for the making of brick and draintile. Later on, hollow ware will be made.

Mr. A. G. Stevens, of Gladstone, Ore., has obtained the county rights for making a patented brick and has organized the A. G. Stevens Brick & Tile Co., and is planning to erect a plant at Gladstone for the manufacturing of his product.

The contract for the 90,000 brick to be used for the Portland new postoffice has been secured by the Oregon Brick & Tile Co., of Beaverton, Ore., and delivery will be made about next June.

The Warrenton Clay Company opened its new plant April 7, with a big banquet and several high officials were present. The machinery part has been installed, but so far no kilns have been built.

The Wenatchee Brick & Tile Co., of Wenatchee, Wash., have placed their order for an entire new hollow ware equipment with the J. D. Fate Company, of Ohio, and the machinery has been shipped. This company has also built two new downdraft kilns.

American Fire Brick Co., of Spokane, Wash., are putting on the market their new magnesite and silica brick and also finding a good demand for their calcined magnesite. Mr. C. P. Oudin has been spending the greater part of last month on the Puget Sound in place of making his regular winter trip to the Hawaiian Islands.

Mr. S. Geijsbeek, of the Geijsbeek Engineering Co., of Portland, who has been spending the greater part of his time investigating and visiting eastern clayworking plants for the past six months, has now returned. He is very enthusiastic over the general situation in the clay business, and was just re-elected secretary and treasurer of the Oregon Clayworkers Association.

The Far West Clay Co., of Tacoma, Wash., has obtained an order for 10 carloads of firebrick and fireclay specialties for new coke ovens to be built at Carbonado, Wash.

SIWASH.

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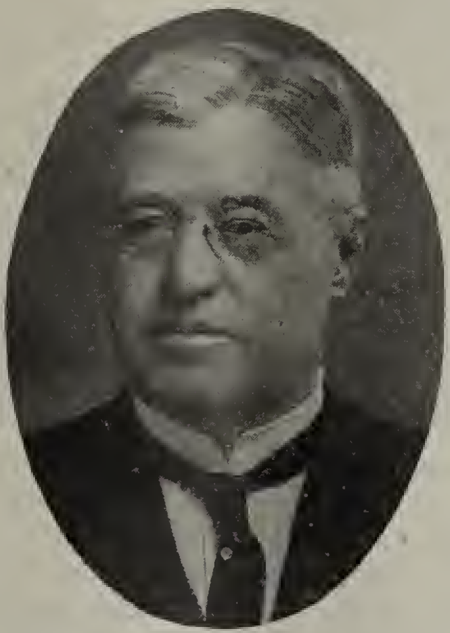
THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Vol. LXVII. INDIANAPOLIS, APRIL 6, 1917. Convention Number.

OFFICIAL REPORT OF THE THIRTY-FIRST ANNUAL CONVENTION OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION, NEW YORK, MARCH 5-10, 1917.

THE CONVENTION ON BROADWAY was in every respect one of the best and most satisfactory meetings in the history of the National Association. In attendance and character of proceedings, it marked progress as has every succeeding meeting of the N. B. M. A. A record breaking attendance had been predicted and undoubtedly would have been realized, but for the abnormal conditions that prevail in the industrial affairs of the nation at this time. The unusual situation, due primarily to the war and rumors of the war, the threatened coal famine, the scarcity of cars which makes it exceedingly difficult for manufacturers to ship their products, coupled with the labor troubles which are rife in the land, and constitute a serious menace to all large manufacturers, particularly those in the clay business, made it impossible for many who wanted to attend the convention to leave their plants even for a few days. This unfortunate combination of circumstances kept hundreds of clayworkers at home who otherwise would have attended the convention. Notwithstanding all this, there was a total attendance of over seven hundred, including the ladies, and these days the ladies must be included in all important undertakings. This large attendance was a decided compliment to the drawing qualities of Greater New York as a convention city. More pertinent and satisfactory even than the large attendance was the enthusiastic interest manifested by the rank and file of the membership in the deliberative sessions of the convention. The fear that sightseeing would interfere with the attendance at the sessions proved groundless. The members gathered in the convention hall promptly at the appointed time and paid close attention to the speakers. The discussions were unusually interesting, as is evidenced by the full report in the following pages. The manifest interest and enthusiasm reminded the old time members of the spirit which prevailed during the early conventions when members vied with one another for the privilege of the floor.



President Charles Deckman, Cleveland, Ohio.

The social functions were especially pleasing. The smokerette was one of the most enjoyable occasions in the long list of N. B. M. A. entertainments. It was distinctively a good fellowship affair, and the amusement features provided by the local committee were the occasion for many compliments. The banquet was up to the high standard of previous years, as the reader will see by the full account of same which follows. In every respect the thirty-first annual meeting of the N. B. M. A. was a decided success and a source of congratulation to the local committees, the entire membership and to the clay craft in general, for it spells progress for every branch of the industry. A delightful spirit of comradery of a high degree characterized every phase of the gathering. It will be a pleasant memory in the years to come to all who participated.

to all who participated.

The meetings of the allied organization, the National Paving Brick Manufacturers' Association, the American Ceramic Society, the Hollow Tile Manufacturers' Association, the New York Paving Brick Association, were each and all well attended.

FIRST SESSION.

Wednesday Morning, March 7, 1917—10:00 o'clock.

President Deckman: The convention will now be in order. For the present, at least, the Chair would request that the gentlemen who are indulging in the pleasure of smoking would refrain from doing so until a later period in the convention's program, when at the pleasure of the convention you will be permitted to indulge. The convention will now be opened by prayer, which will be offered by the Reverend James E. Wasson, of this city.

The Opening Prayer.

Rev. James B. Wasson: Our Heavenly Father, we invoke thy blessing on these masters of the great industry in con-to which these items or papers and lectures particularly refer.

So, at this time, we may conclude that we are in our annual gathering as a family reunion, and your president desires at this time to insist upon the membership attending the sessions of this convention on time, because there has been prepared by our secretary a most excellent program for your information and advisement. I trust you will not fail to refer to your program and be prompt during the remaining sessions.

I want to express my thanks for the compliment you have paid me in selecting me as your presiding officer during the past year. It is, indeed, a compliment to any manufacturer to be selected to preside over a body of men and corporate institutions, such as comprise our membership, and while the duties are not arduous, it is necessary at all times to have a head to all organizations, and I most sincerely thank you for the compliment that you paid me a year ago in electing me to this very honorable position. Now, in fulfillment of my promise made to you a year ago, so long as it may be my province to preside over the deliberations of this convention, promptness and brevity will mark my further action. I thank you. (Applause.)

Secretary Randall: The next in order is the report of our treasurer. (Applause.)

REPORT OF TREASURER SIBLEY.

March 7, 1917.

To the Officers and Members of the National Brick Manufacturers' Association:

Gentlemen—I beg to submit herewith a statement of receipts and disbursements for the year just ended.

This is the most gratifying report in the history of the Association, as the surplus has attained the comfortable figure of $997.53, and can no longer be treated as a joke.

This puts me in a very embarrassing position in trying to measure up to the specifications required of the incumbent of the treasurer's office, but I will try to be as resourceful as the white folks mentioned in a story I heard not long ago about a certain negro preacher, who was very much edified on one occasion by the recital of a dream had by a member of his church.

"All dis time," said the narrator, "I was a-dreamin' dat I was in ole Satan's dominions. I tell you, pahson, dat sho was a bad dream."

"Was any white man there?" asked the dusky divine.

"Sho—plenty of 'em," the other hastened to assure his minister.

"What was they doin'?"

"Every one of 'em," was the answer, "was a-holdin' a cullud pusson between him an' de fire."

Respectfully submitted,
JOHN W. SIBLEY, Treasurer.

Receipts and Disbursements account of the Thirtieth Annual Convention of the National Brick Manufacturers Association.

RECEIPTS.

Balance in treasury, account 1915		$ 564.49
Renewal fees, account 1916	$2,119.00	
New membership fees, account 1916	420.00	
Pamphlets and reports sold, etc	97.80	
Total receipts		2,636.89
		$3,201.38

DISBURSEMENTS.

Paid for Convention program, mailing, etc., per voucher	$ 134.00	
Paid for Convention report, mailing, etc., per voucher	344.33	
Paid for Wreford pamphlet, mailing, etc., per voucher	104.02	
Paid for membership American Testing Society, per voucher	15.00	
Paid for Convention numerical roster, per voucher	53.49	
Paid for miscellaneous printing, per voucher	186.44	
Paid for engrossing certificates, per voucher	6.40	
Paid for postage, expressage, telegrams, etc., per voucher	155.53	
Paid for lantern, operator, slides, etc., per voucher	41.40	
Paid for clerk hire, per voucher	300.00	
Paid for assistant secretary, salary, per voucher	200.00	
Paid for secretary's allowance, per voucher	600.00	
Paid for Convention expenses, per voucher	63.04	
Total expenses		2,203.85
Balance in treasury		$ 997.53

RECAPITULATION.

Balance in treasury, account 1915		$ 564.49
Total receipts, 1916	$2,636.89	
Total expenses, 1916	2,203.85	
Excess of receipts over disbursements		433.04
Balance in treasury, 1916		$ 997.53

President Deckman: This brings us to a very important part of our program, the election of officers and the appointment of standing committees. Nominations for president are now in order.

Election of Officers.

W. E. Dunwody, Macon, Ga.: Mr. President—I want to have the pleasure of nominating Mr. Fritz Salmen, of New Orleans, for the responsible position of president. I do not think it necessary to make any extended remarks in regard to Mr. Salmen's efficiency; he has been identified with this Association for a good many years, and I think he will make us a very efficient officer. (Applause.)

Treasurer John W. Sibley, Birmingham, Ala.

President Deckman: Are there any other nominations? If not, I will instruct the secretary of this Association to cast the unanimous ballot of this convention for Mr. Fritz Salmen for president of this Association for the ensuing year, and will appoint Mr. Dunwody and Mr. Burton a special committee to escort Mr. Salmen to this platform. (Applause.)

Mr. Burton: Mr. President—It gives us great pleasure to present the newly elected president. (Applause.)

President Deckman: Mr. Salmen, we will install you when we have finished the election of the other officers. We are now ready for nominations for first vice president.

Charles H. Bryan, Detroit, Mich.: I believe, Mr. President, that I said when I saw you a few days ago in New Orleans that I did not expect to be here, but I could not forego the pleasure, after having once started my friend Clippert up the ladder of giving him another boost, so I traveled 1,500 miles to have the pleasure of placing in nomination my friend, Mr. George H. Clippert, of Detroit, as first vice president of this Association. (Applause.)

President Deckman: If there are no other nominations, the secretary will cast the ballot of this convention for Mr. George H. Clippert, of Detroit, for first vice-president. I declare Mr. Clippert elected first vice-president of this Association, and will appoint Mr. Bryan a committee of one to escort Mr. Clippert to this platform. (Applause.)

Mr. Bryan: Mr. President—It is with pleasure I present Mr. Clippert.

President Deckman: We will hear from you a little later, Mr. Clippert. Nominations are now in order for second vice president.

Will P. Blair, Cleveland, Ohio: Mr. President—A great many years ago, I am not going to say how many, there was organized in eastern Indiana a paving and building brick company which erected a factory that has ever since been managed by the gentleman whom I wish to nominate as second vice president of this Association, Mr. J. W. Robb, of Clinton, Ind., and I want to add that in all these years, no matter what duty has been required of Mr. Robb, he has always served faithfully and well. I, therefore, wish to place the name of J. W. Robb in nomination for second vice president of this Association. (Applause.)

President Deckman: Mr. J. W. Robb, of Indiana, has been nominated for second vice-president, and if there are no other nominations, I will instruct the secretary to cast the ballot of this convention for Mr. Robb. I announce Mr. Robb your second vice president, and will ask Mr. Blair to escort him to this platform.

Mr. Blair: Here is the victim, Mr. President.

President-Elect Fritz Salmen, New Orleans, La.

President Deckman: You will be seated, Mr. Robb. An opportunity is now accorded you, gentlemen, of presenting the name of any suitable person for third vice president of this Association.

Christopher Steadman, New York City: Mr. President—We have with us a New York brick manufacturer who is loved and respected for his integrity and square dealing, and it would be a great credit to this Association to have him as one of our officers. I am pleased to nominate Mr. W. K. Hammond, of New York City, for third vice president of this Association. (Applause.)

M. E. Gregory: I second the nomination.

President Deckman: Mr. William K. Hammond, of New York City, has been placed in nomination for third vice-president. Are there any other nominations? This nomination has been duly seconded, and if there are no further nominations, the secretary is instructed to cast the unanimous ballot of this convention for Mr. Hammond for third vice president. I do not see Mr. Steadman, but I will ask Mr. Gregory to escort Mr. Hammond to this platform.

Mr. Gregory: Mr. President—I have the pleasure of presenting Mr. Hammond.

Mr. Deckman: We are pleased to greet you, Mr. Hammond. Gentlemen, you will now select some suitable person to act as treasurer for the ensuing year.

R. G. Eisenhart: The office of the treasurer of this Association is a very important one. There are times when we brickmakers try little experiments and sometimes they prove very expensive, and in order to avoid that at this time, I propose to nominate a man who can show a good balance and come forward with a good joke at the proper time. I nominate Mr. John W. Sibley, of Birmingham, Ala., for treasurer. (Applause.)

President Deckman: Further nominations are declared out of order. (Laughter.) The secretary will cast the ballot of this Association for John W. Sibley, of Alabama, for treasurer of this Association. (Applause.)

Secretary Randall: The ballot has been cast, Mr. President.

President Deckman: I declare Mr. Sibley elected and Mr. Sibley may present himself to this platform. (Applause and laughter.)

President Deckman: You will now select some one to act as secretary of this Association for the ensuing year.

William Conway, Philadelphia, Pa.: Mr. President, it is with a great deal of pleasure that I nominate to this very important office our friend, Theodore A. Randall, of Indianapolis. (Applause.)

President Deckman: The ruling of the Chair applying to the nomination of Mr. Sibley as treasurer, applies to that of secretary, and I, therefore, declare Mr. Randall unanimously elected as your secretary for the ensuing year, and he will present himself unescorted. (Laughter and applause.) We are now up to the very splendid and cheerful duty of installing these officers. This seems to consist largely of giving them an opportunity of unbosoming themselves of the surplus energy they have pent up within them during their several years of probation seeking to attain these high and honorable positions. You will, therefore, listen for the next three-quarters of an hour to your newly-elected president, Mr. Fritz Salmen. (Applause.)

Installation of Officers.

President-Elect Salmen: Brother Brickmakers and Ladies—My predecessor don't know me as well as you all do, for if he had he would not frighten you with the expectation of having to sit here and listen to me three-quarters of an hour. I think I will relieve you of that dilemma, for I will only keep you about three-quarters of a minute, and leave the rest of the time for my worthy assistants, who have been elected to their respective offices.

I want to say this: I am glad to be here with you again. Last year it was impossible for me to attend the convention, but I was with you in spirit, and I thank you for having thought of me at that time. I have been elected to the important and honorable position of president of this Association. I fear you will be somewhat disappointed, but I will promise you to do the best I know how. I think I will have pretty clear sailing, because I will be sandwiched in between two giants. My predecessor, Mr. Deckman, who is quite a factor in his line of manufacture, has opened up the way for me to follow him, and my friend Clippert, who is to follow me, will ably assist, I know, should I fall short anywhere on the wayside. I do not know that I have much else to say. The program for this convention has been outlined by the secretary and I hope we will have a good attendance at all of our meetings. We are only to have one session a day, therefore, I think every member ought to try to make it his object to be present at this one session and give the balance of his time to mingling with each other in the lobbies and learning what we can from each other and visiting the Building show, which is now being held at the Grand Central Palace. I want to thank you all for the great honor you have done me today, and I hope you will bear with me if I should fall short in my duties. (Applause.)

It now gives me great pleasure to introduce to you a very dear friend of mine, who has been elected to the office of first vice-president, Mr. George H. Clippert. (Applause.)

First Vice President George H. Clippert: Mr. President, Ladies and Gentlemen—I am very agreeably surprised, to begin with. I thought I was going to be introduced by our friend, Deckman. I thought the way he started off he was going to flay me and I was wondering what he would say. I want to thank you sincerely for this boost on the N. B. M. A. ladder this morning. It looks awfully good to me, more especially after hearing our friend Burton's talk, saying the brickmakers are going to heaven, and hearing the treasurer's report, why certainly I want to continue in an association of this kind. My friend Salmen says, "Clippert is here to help me out." He don't need any help. He is one of the most successful brick men we have, and he is going to follow right along in our friend Deckman's footsteps. He doesn't have to improve on them, but he will follow along, and this Association will continue to grow and prosper. I want to say to my friend Salmen that he ought to feel highly flattered to be elected president of this Association in New York City—the city which is recognized as the largest city in the world today—and I would consider that a very high honor. I know I do myself feel honored to have been elected first vice president in this city. I thank you. (Applause.)

President Salmen: I now have the pleasure of introducing to you the gentleman who has been elected to the office of second vice president of this Association, Mr. J. W. Robb, of Indiana. (Applause.)

Second Vice President J. W. Robb: Mr. President, Ladies and Gentlemen—I assure you that this is an honor I appreciate fully. To follow in the footsteps of Mr. Deckman and Mr. Salmen and Mr. Clippert, who have all made a success of their business, is an honor. Mr. Blair referred to me as having been in business a long time, but he did not tell you how poorly I had done the work. I am sure that I will have no duties that will prove very arduous for the next two years, because Mr. Salmen and Mr. Clippert will take care of this ship during that time, and I feel that when the time comes for me to take charge that under the guidance of those two master hands, with Treasurer Sibley to take care of the money and Secretary Randall to tell me what to do, I will get along fairly well. (Laughter.) I thank you for the honor that has come to me and wish you all success. (Applause.)

President Salmen: Now, ladies and gentlemen, it gives me great pleasure to introduce to you a gentleman who I believe has not been before the Association heretofore, but he is one of the greatest brickmakers in this great country of ours, Mr. William K. Hammond, of New York City, who has been elected to the office of third vice-president of this Association. (Applause.)

Third Vice-President Wm. K. Hammond: Mr. President, Ladies and Gentlemen—I have heard it said (although this was never said to me, "This is so sudden"; and I say it from the bottom of my heart. The gentleman over there, the secretary, said to me, "This is a fine association, and we want you to come with us," and then a little later he said, "I think you are good timber for the third vice president," and I replied, "Oh, my, no." We have a way in New York of saying things, and I said, "Forget it, forget it," but he was not admonished by what I said, and here I am. (Laughter.)

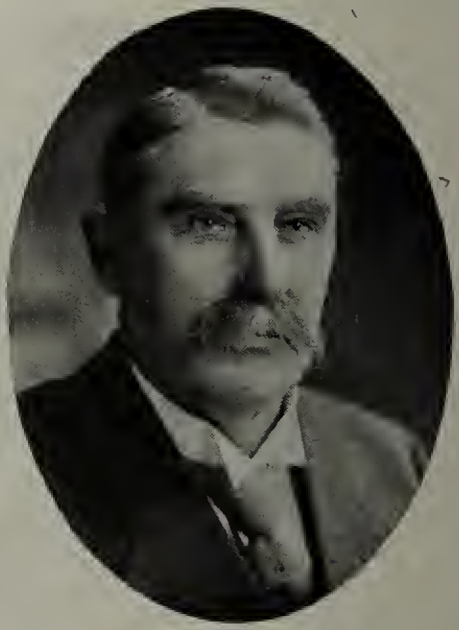
You know, as brickmakers, we could not succeed if we did not use machines. What I mean is obvious. (Laughter and applause.) I am impressed, gentlemen, with this Association. I have read its reports. A great many months ago I attended my daughter's graduating exercises, and I heard one of the leading professors say to the graduating class, "Keep abreast of the literature of your day." I have endeavored to keep abreast of the literature of our business. I find it in the publication of our friend here, from Indiana, the master machinist. As one of my predecessors has said, I will get better acquainted with you all, so I will not say "Deckman" and be looking at Mr. Sibley, and when we get better acquainted I will know better how to act. I ask your indulgence and assistance. I thank you all sincerely for this honor, and if I do not do as I should do it will be because I do not know any better. I will do the best I know how. Again I would say I thank you sincerely. (Applause.)

President Salmen: I now have the pleasure, ladies and gentlemen, of introducing to you the man who is reputed to be the one who shows an increase in our treasury from year to year, and has proven the truth of the story in his report today, Mr. John W. Sibley, our treasurer. (Applause.)

Treasurer John W. Sibley: Ladies and Gentlemen of the Association—I am certainly filled with a sense of gratitude and appreciation at this constant evidence of your kindness and partiality. I certainly appreciate the honor you have again conferred upon me, and will endeavor to maintain the surplus, and provide a joke, though it has been a pretty hard proposition to do the latter. For fear some of you may assume that the surplus is assuming undue proportions, I will say that about half of it has already been appropriated to meet the work of Professor Orton's committee work on technical investigation, but we will try to recuperate and come back with a better showing next year, which reminds me of

First Vice-President George H. Clippert,
Detroit, Mich.

Ex-President C. P. Mayer,
Bridgeville, Pa.


Second Vice-President J. W. Robb,
Clinton, Ind.

an incident I heard of a darkey who was taken sick and called in a physician of his own color. After he had doctored him awhile the patient did not improve and so he called in a white physician to attend him, and the white doctor took his pulse and made him stick out his tongue, and then he said to him, "Did your other doctor take your temperature?" The patient shook his head feebly and said, "I don't know, boss; I haven't missed anything yet but my watch." (Laughter and applause.)

President Salmen: I do not know that it is necessary to introduce the gentleman who has been elected secretary of our Association, because he is known to all of you. He has been our secretary for thirty-one years; however, I will ask Mr. Theodore A. Randall to stand up and say something nice to you. (Applause.)

Secretary Theo. A. Randall: Mr. President, Ladies and Gentlemen—It is, indeed, a pleasure to be here in the greatest city in the world and receive at the hands of the representatives of the greatest industry in the world, this honor for the thirty-first time. It is especially appropriate for us to feel grateful on this occasion, following the remarks of Fire Commissioner Adamson and our good friend Burton as to ancient history and come on down to modern times and remind you that this great city is a brick city. That is something we can all remember and take home with us, and tell our friends that we have not only visited the greatest city, but the greatest brick city. We had the largest convention in Cleveland last year we ever had, but I am delighted to see just a fine first session here in New York City. They have told us repeatedly that we could not have a convention in New York City, because we could not get anybody into our sessions, etc. I feel like the young fellow who got a job during the recent street car strike. You know they still have a few horse cars here operating on some of the side streets, and they put this new man on one of those horse cars. He run along for two or three days, and his average receipts would run about two or three dollars a day. One night, when he reported, he turned over his receipts and they amounted to something like thirty dollars. The managers could not understand it, and they called him in and said to him, "How do you explain this increase in your receipts?" He said, "Well, I'll tell you; I had been running on that side street and business wasn't very good, and I made up my mind I could do better, so I just brought my car over on Broadway." (Laughter and applause.) So I thought, after traveling all over the country, that bringing the Association here and holding a convention on Broadway would be decidedly helpful to us. This splendid audience proves the wisdom of our course. I thank you most sincerely again, and will promise as I have so many times before, to do my level best. (Applause.)

President Salmen: That finishes the installation of officers, and I will ask Mr. Randall to announce the next number on the program.

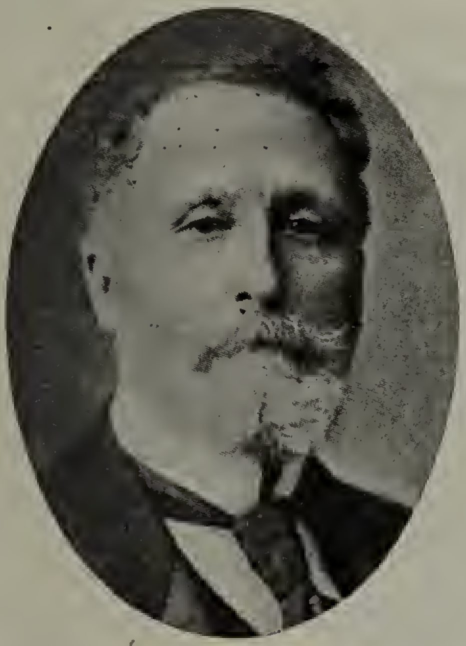
Secretary Randall: There is another election. Each year we elect a member on the Committee on Technical Investigation. The assistant secretary, as you know, is an appointive office. We have five members on the Committee on Technical Investigation, Prof. A. V. Bleininger, of Pittsburg, whose term expires in 1921; Marion W. Blair, whose term expires in 1920; R. Kanengeiser, of Bessemer, Pa., term expiring 1919; Prof. Edward Orton, Columbus, Ohio, whose term expires next year, and W. D. Richardson, whose term expires this year. Mr. Richardson fully expected to be here. He is now with the Hebron Pressed Brick Company, Hebron, N. Dak. He left Hebron a couple of months ago, and closed the plant, leaving orders for some repair work that was to be done on his return, and he found it necessary to return sooner than he had anticipated. I have no suggestions to make in regard to this committee, except to say that Mr. Richardson is a very efficient member of this committee, and is much interested in its work.

M. E. Gregory: I nominate Mr. Richardson to succeed himself on this Committee on Technical Investigation for a term of five years.

John P. Cahoon: I second the motion.

President Salmen: If there are no other nominations, I think we can take this by consent, and Mr. Richardson will succeed himself on this committee. What is the next, Mr. Secretary?

Secretary Randall: This completes the routine business, with the exception of the appointment of committees, which will be taken care of a little later. The next on the program is the Report of the Committee on Technical Investigation, by Prof. Edward Orton, who, as most of you know, has a meeting of the American Ceramic Society this morning at Hotel Astor. But he will be with us later in the week and then tell us what the committee is doing and what they expect to do. The first formal paper on the program is a paper, "Our Fuel Problem," by R. Kanengeiser, of Bessemer, Pa. Mr. Kanengeiser came to me yesterday with an apology, which is unusual for him, for he is a man of action. However, the great plant with which he is connected, the Bessemer Limestone Company, has been merged with that of the Metropolitan Paving Brick Company, of Canton, and this has entailed upon Mr. Kanengeiser a great deal of extra work, so he has not been able to prepare


Third Vice-President W. K. Hammond,
New York City.

Ex-President R. G. Eisenhart,
Horseheads, N. Y.

Secretary Theo. A. Randall,
Indianapolis, Ind.

a formal paper. He expected to be present this morning and make a brief talk on the subject, "The Fuel Problem," which is particularly interesting just at this time. Possibly he will be with us at a later session. Passing this paper, the next is "The Welfare of the Industry." The thing we had in mind in this connection was a general discussion of business conditions and the details in connection with which we might discuss and talk over and so ascertain points and information which would enable us to better improve all branches of the business for the coming year. One of the chief essentials, it seems to me, is organization; the brick men of each community working together instead of working against each other. As you all know, it has been the bane of the business that local manufacturers have looked askance at one another and they have not worked together for the advancement of the industry as have those connected with other industries. They have their organizations and they get together and have the talks around the table. Had the brickmakers of the country worked along the same lines during the past decade, I believe the industry would be in much better shape today than it is. I think we must act more concertedly in the future than we have in the past. I want to say that I think the spirit of co-operation exists in the industry today more than it has ever before. The Detroit manufacturers, the Cleveland manufacturers are working together very effectively. In the South, our friend Dunwody has organized the brick men in Georgia and so it is in other places. The spirit of organization is rife, and I believe we will see the industry progress and advance the coming few years in a greater degree than it has in the past decade. There is a gentlemen I would like to introduce at this time, Mr. Samuel G. Webb, chairman of the National Fire Resistance Council, of New York City. Mr. Webb has a message for us which I think, Mr. President, would give us something to think about during the coming year.

President Salmen: We would like to hear from Mr. Webb on this subject, which is one of the most important before the brickmakers today.

Mr. Samuel G. Webb: Mr. President and Gentlemen of the Convention—Mr. Randall indicated to me that I might be called on to say something to you, so I have departed from the custom which seems to be prevalent of talking extemporaneously, and have prepared a few remarks in writing, from which, with your indulgence, I will read.

FIRE PREVENTION.

BY S. G. WEBB, NEW YORK CITY.

Mr. President and Gentlemen of the Convention:

I have been asked by your Secretary to say a few words on the question of Fire Prevention.

I want to speak to you of the part you manufacturers of fire-resistive building materials could and should play in preventing fires.

You have an opportunity for good, not only for yourselves, in the increasing of your business, but for the country at large, in decreasing the national fire waste by urging and working for, in season and out of season, a wider use of materials that will not burn, in the construction of all buildings.

You have your own association, or I might rather say associations, as I understand that I am addressing members not only of the National Brick Manufacturers' Association, but of the National Building Brick Bureau, the National Paving Brick Association and the American Ceramic Society.

All of these bodies have a big and useful work to perform and are doing a yeoman service in the interest of clay products, and, in a larger sense, in the interest of the people at large.

The work for the interest of the people at large, however, could be greatly enlarged by extending to other industries who are also producing fire-resistive materials a spirit of co-operation.

Let us consider for a moment the relationship between the national fire loss and the methods of construction that we as a nation practice.

Our national fire waste is somewhere around $250,000,000 per year of direct loss, with two or three times that amount added as an indirect loss. There are built in this country only about 1 per cent. of all buildings which are considered, by present standards, strictly fireproof

There is, I submit, a direct relationship between these two facts, and the two conditions are in large measure interdependent. In other words, if the number of fire-resisting buildings was greatly increased, the fire loss would automatically greatly decrease.

There has been a growing appreciation of this fact and of these conditions, and the country has been asking for some years what may be the remedy.

Fortunately, the International Fire Prevention Congress, which met in London, England, in the year 1903, laid down certain basic principles which point the way.

The first of these basic principles was that nothing was strictly fireproof, but that many things had fire-resistive value. They, therefore, recommended that the use of the term "fireproof" should be abandoned as misleading and frequently incorrect, and that the term "fire resisting" or "fire resistive" should be substituted therefor in the general vocabulary.

Another basic principle that the Congress laid down was that it was possible, and that this possibility should be made a governing factor in construction, to greatly broaden the catalogue of fire-resistive materials of construction and types of construction, and so they established three broad classifications, the first being a high type of fire-resistive value, the second a lesser type and the third a still less type of fire resistance.

Another basic principle the Congress laid down was that values in fire resistance of the materials and parts of construction, which would place them in their proper places in either of the three broad classifications, could be determined by carefully adjusted specifications of fire tests.

We have had these principles as a guide for all of these years, and there has been a gradual acceptance of the correctness of these principles in the country at large.

In the year 1914 the National Fire Protection Association adopted the same principles, and more recently the American Society for Testing Materials has done the same.

The proper committees in these two bodies are studying these questions in co-operation, and I do not believe that I am too optimistic in predicting that a great measure of progress will be realized in the very near future in the work of properly classifying materials and determining upon proper fire test specifications for materials and parts of construction in their proper classifications.

Still another factor, in the judgment of many persons, is of high importance in securing a lessening of the national fire waste by the encouragement of improved methods of construction by the U. S. Government.

Inasmuch as the fire waste is a national economic question, there is no logical reason whatever why the national government should not take an active hand in its amelioration.

Charles H. Bryan, Detroit, Mich.

Many persons believe that it is absolutely correct in principle that the national government, through the United States Bureau of Standards as its instrument, should greatly enlarge its work in the investigation of structural materials and so greatly increase our present knowledge of the physical excellencies or deficiencies of all structural materials.

Many persons believe that if the people benefit in even a comparatively small part by the reduction of the economical loss, as represented by the fire loss in the country, it then is perfectly good business on the part of the United States Government to spend a very much larger amount of money in this work than it is now doing.

The National Fire Protection Association is doing valuable work for the country in developing specifications governing the construction of buildings in many classes in grades A, B and C, respectively, in each class.

The large need, as it appears to many persons, therefore, is that intelligent classification of construction, both of the materials used therein and of the completed buildings, would be a considerable step forward in the improvement of general building conditions and the lessening of their liability to loss by fire. Such classifications, however, should be uniform and generally accepted by the national agencies and by the people at large. Who is to do this unless all the manufacturers join together in the work?

I stated at the beginning of my remarks that I believed that it would be highly desirable for you manufacturers of fire-resistive materials to extend a spirit of co-operation to other industries in bringing about such results as I have briefly sketched.

Some two years ago the executives of many industry associations commenced the practice of meeting together in conferences to see whether a constructive program could not be devised, to the support of which all could consistently lend their aid.

Several of such conferences have occurred in different cities during the last two years, with the result that the movement has taken form, and at the last of these conferences, held in Pittsburg in October last, the movement was given a name, the National Fire Resistance Council. So here is the instrumentality.

The Council offers itself as a medium through which all industries may work for such ideas and ideals as I have spoken about to-day. The support of such a movement should be the widest spread possible among the manufacturers of various materials and types of construction, so that moral force of the Council may be as large as possible, both in numbers and in geographical distribution over our country.

I have the privilege of having been selected to carry forward the work of the National Fire Resistance Council, and I appreciate the opportunity that has been given me to-day to say a few words about its purposes and scope.

The Council desires to have the sympathy and support of 100 per cent. of the manufacturers of clay products, who, together with the manufacturers of portland cement, metal lath and the many other important industries, will make a force for good in the country that will not be denied, and will without question produce greatly improved conditions for the country at large; better economic conditions through the reduction of the fire waste and a great increase in the market for all classes of fire-resistive materials and devices.

I thank you, Mr. President, and gentlemen of the National Brick Manufacturers' Association, for being accorded this opportunity to appear before you.

General Discussion.

President Salmen: Gentlemen, Mr. Webb has presented a very able paper, and I think we will be benefited by any discussion that may be raised on same.

Secretary Randall: I would like to ask if there is a representative of the National Fire Protective Association in the room. Mr. Wentworth, the national secretary, was to have been here, but he has been detained; but he expected there would be a representative of that Association here who would address us. We have a gentleman with us at this convention who comes from far-away Russia, Mr. Alexis Zakharoff, a brickmaker of Petrograd. Mr. Zakharoff is a very interesting speaker, though a little modest, and Mr. Burton will introduce him.

A. R. Root, Philadelphia, Pa.

Mr. Burton: Unfortunately, Mr. Zakharoff left the room a few minutes ago, but I will try to get him for you in just a little while.

Secretary Randall: While we are waiting for the gentleman, I would like to make an announcement or two. There will be a smokerette this evening which is a complimentary entertainment given by the Local Committee on Entertainment. The membership badge will admit all visitors, and this includes the ladies. You are all expected to be there and to bring your friends. The ladies do not have to smoke—unless they want to. Mr. Alfred Pettit, who is chairman of the Ladies' Entertainment Committee, will announce at the smokerette what entertainment will be provided for the ladies during the balance of the week. Then there is another matter I want to call your attention to now. If any of you have railroad certificates and have not turned them in, leave them with the Assistant Secretary immediately after adjournment. It is necessary that these certificates be vised by the railroad man in order that you get the reduced rate returning. An additional announcement is that in regard to the banquet on Thursday night. Those who have not already procured their banquet tickets should get them immediately after adjournment. One thing more, and then I am through. Is Mr. A. R. Root in the room? I would like to have him come forward for just a few moments. Gentlemen, this is Mr. A. R. Root, of Philadelphia. He is the only member of this Association, except myself, who has not missed an N. B. M. A. convention. (Applause.) He is a modest man, but I wanted you to see the other man who has come to these conventions year after year, has never missed one of the thirty-one. (Applause.)

President Salmen: While we are waiting for the Russian gentleman, has anyone anything to offer of interest to the trade?

The Welfare of the Industry.

C. P. Mayer, Bridgeville, Pa.: Mr. President, Ladies and Gentlemen—I never let pass an opportunity to say a few words to the brick manufacturers and the members of the organizations to which I belong. I want to say that I belong to quite a number of organizations. The question we were to discuss, "The Welfare of the Industry," is easily expressed in a few words, and that is "Get Together." There is nothing so important to the business men today as those words. John D. Rockefeller, and when I said this before the lumbermen a few weeks ago in a convention, it brought forth a great big groan. I said that the business men of this country should build a monument to Rockefeller after his death, and they groaned. I do not hear a groan here today, and for that reason I take it for granted that I may say a few words about John D. Rockefeller. He was the first man in this country to give us a practical illustration, through the Standard Oil Company, of how business men ought to get together. Gentlemen, I can see the picture painted by John D. Rockefeller as plainly as I can see that picture on the wall there on the other side of the room. The business men of this country did not understand him then, and there are a whole lot of them who don't understand him today, and I am sorry to say some of them are in the brick business. Now, I am only filling in time while our Russian friend is coming in. (Laughter.) I want to call your attention to a few things the business men, not any particular line, but all of them, must learn, if they haven't got together in a "gentlemen's agreement." Along that line I want to say there is a decided change in conditions since I first went into the business. At that time, every one thought it was their duty to find out first what his competitor was selling his goods for, and then to go a little under that, and if we had to make an article that was a little bit off so as to get under, we did so. That is not the principle of business today. We aim to get as much profit and as splendid an article as it is possible to get. That has been brought about by education. I would like to know if there is any man in this room that knows today of any commodity in this country that is not price regulated, either in the raw material, or the finished product, or in the sale of the material. I will make the prediction that there are not many here that can name one. Some one may say brick, and I guess it is the only thing where that is true. Now in other subjects the brick men have been educated until they have as much sense as any other industry, and they need to get together.

In Pittsburgh, the common brick fellows got together, and when I say "common" building brick, the other fellow looks down as though he was one of the lower fellows on a lower social plane, but I want to tell you when we got them together, our first meetings were not very pleasant. Some of them did not want to go into the same room, because they had been fighting each other for years, but we kept meeting and we got them together time and again; we dined and wined, and smoked a little bit and after a little while we came to the conclusion we were not such bad fellows after all. Each one got acquainted with his competitor and found he was a pretty good fellow. In the first meetings we had a distinct understanding that it was not a price regulating organization, but the first thing we did was to standardize brick of Pittsburgh, and took away from the bad fellows one means of beating the other fellow. Now Jones' brick and

Smith's brick can both be laid in the same wall and you can never tell the difference.

Franklin once said, "He who by the plow would thrive, must either hold the plow or drive." But the business man of today has modified that in this way, "He who would thrive, must both hold the plow and drive." You must not only be able to make brick, but you must be able to get together to sell brick. You can best do that, in my experience, in the brick business as well as in other organizations, by getting together, dine and wine with each other. It is said that man's eyes are the windows of his soul. Look into each other's eyes and drink from each other souls good fellowship. It is a mighty mean fellow who hasn't something good in his soul. You must remember that the best way to take care of the price situation in your own case is to take care of your fellow competitor's price. If you see to it that he gets a good price for his brick, he will see to it, unless he is a meaner fellow than I have ever found, that in turn he will protect your price. If you will go to some of the rural districts and look at some of the brickmakers, even their person looks haggard, their plants dilapidated, they are working in a lifetime job wearing out their machinery and their life, using up their clay and having nothing to show for it. That recalls an incident which was told me not long since. In this case, it was a farm. A fellow named Jake had inherited a farm from his father. He had grown old on the farm, and had never been of any benefit to the community; never mingled with his neighbors, and finally Jake came to the final effort. In other words, he died, and his neighbors gathered in to bury him. Of course, as is usual at a funeral, they began to talk about him, but they could not talk about the good things Jake had done. One old fellow was considerably worried because there was nothing good being said about Jake, and finally he said, "Well, he was a good old smoker." A brick man will exhaust his clay bank, wear out his machinery, and wear out his life trying to make a living, and when he dies, he is only a good old smoker, if he smokes at all. That is all that can be said of him.

Most brickmakers are a little shy when anything is said about combining for prices. You need not be. I belong to the lumber organization, and at one time we were indicted on account of the Sherman anti-trust law, but fortunately for us, the government dismissed the case. You know the story of the ship that was plowing along, and the lookout man said to the captain, "We are entering the torpedo zone; shall we slow up?" and the captain said, "Torpedo zone, hell; full speed ahead." Now that expression just fits our case; let us get together and go ahead at full speed. You have got to get together if you are going to get decent prices. It is your duty to get living prices. Why should a man strive a lifetime and die without anything to his credit? (Applause.)

President Salmen: I want to thank Mr. Mayer for the plain language in which he told us the truth, and I hope we will stand up and talk in this way in this first meeting. It will do us all good. Is there some other brickmaker in a district in which the brickmakers have been organized to better their conditions who will tell us about it? I think we are going to hear from Mr. McNees.

G. W. McNees, Kittanning, Pa.: We are all interested in the business that brought us here. I am about to ask a favor from this convention, and it will take but a few minutes. We are all interested in the address to which we have been listening, but I want to ask this convention to deviate for a few minutes from the regular order of business and allow me to bring up a matter which does not directly concern the manufacture of brick. May I have the consent of this body to speak for about three minutes?

President Salmen: You may proceed, Mr. McNees.

Mr. McNees: I thank you, Mr. President. We do not live by bread alone, and there comes a time in the lives of men and of nations when business, personal business, is not of paramount importance; when the honor, or life and the liberty of a man and a nation are paramount. Therefore, at this time, I desire to offer a resolution expressive of the sense of this convention, and I should be very sorry, indeed, looking at the matter as I now look at it, if this first session should adjourn under present conditions without some expression on this matter. I therefore beg the privilege of offering a resolution at this time. If you do not care for it, you can vote it down.

Patriotism Above Personal Interest.

Resolved, That the National Brick Manufacturers' Association, in convention assembled, representing as it does every state in our Union, as well as every political party, stands with the great body of patriotic citizens for American honor, American rights, and for the time-honored principles of international law; that we favor the passage of the armed neutrality bill asked for by our President, and that we condemn as unpatriotic, traitorous and practically treasonable the action of a few United States senators in defeating the will of the American people in the closing hours of the recent congress. (Applause.)

Mr. President, I move the adoption of this resolution without debate, and I trust it will carry.

W. K. Hammond: I second the motion.

Mr. Sibley: Let's make it a standing vote.

President Salmen: All in favor of adopting this resolution will stand.

(The audience arose with one accord.)

President Salmen: I believe this resolution met the approval of every man and woman in the room, and I declare it adopted. (Applause.)

Mr. McNees: I thank you, Mr. President, and as well the members of this Association for their action.

Will P. Blair: I move that the secretary of this Association be instructed to at once forward a copy of this resolution to the President and Vice-President of the United States.

G. W. McNees, Kittanning, Pa.

Seconded by many and carried.

President Salmen: Did Mr. Burton find the gentleman from Russia?

Mr. Burton: I was not able to find him, but I hope to have him present at one of our other sessions. You will all be interested in hearing him, I know.

Importance of Concerted Action.

I would like to say a word in substantiation of what our ex-president Mr. Mayer has said in regard to getting together. I have worked all my life trying to get better prices and get the brick men together. I have made several efforts and I have met with more or less success. The finest illustration I have ever known is that of the old farmer who had lived on the farm all his life. His boys and girls had all left the farm and gone to town to live, and he had the old farm on his hands, and he decided to sell it. Finally, one of his friends said, "If you want to sell the farm, why don't you put it in the hands of a good real estate man?" He thought that was a pretty good idea, so he went to a first-class real estate man and told him he wanted to sell the farm, so the man came out to see the place, and asked the farmer to show him around so he could see some of the good points. He went away and came back in a day or so with a prospectus all written up about the farm, also with a contract he was to sign. The old farmer read the prospectus through, and the real estate man said, "How do you like it? Here is where you sign the contract." The old fellow said, "I'll not do it. The old farm looks a whole lot better to me than it ever did before." (Laughter.) So if you will fix up your plants and improve them and advertise your brick for buildings, for roadways, you cannot blame anyone but yourselves if you do not get better prices. Let us profit by the example of the railroads. You know that under the Interstate Commerce Commission now the president or the vice-president or any one else who gives a rebate can be sent to jail. We have a law now where no two men can get together and make prices. What we want to do is to get Congress to establish a brick commission and put any brick man in jail who cuts prices. (Laughter and applause.)

Will P. Blair: I am not going to make a speech; but we are told very often that we can learn as much by example as by precept. Yesterday afternoon, a gentleman whom I never met before handed me what is indicated on the outside by these words: "Code of Practice of National Association of Marble Dealers." On the first page it says: "Code of Practice of the National Association of Marble Dealers Governing Specifications of Bids and Execution of Contracts for Exterior Marble Work." Turning to another page, I find the words: "Contracts, Definitions of Solicited Bids." "Solicited Bids, How Addressed." Turning to still another page, I see No. 3: "When a Contract Is a Contract." No. 4: "Bids to Be Confidential, the Opening of Same." No. 5: "Contracts on Standard Forms of National Marble Dealers Preferred." No. 6: "Charges Eliminated. What Contracts Include." No. 7: "Standard Grades of Marble. Workmanship to Be Expected." No. 8: Form of Proposition for Marble Work." Then on the last page I see these words in fine print: "We approve the code and will maintain it." And then there is a place for a man's signature. Why can't we follow the example? That is my speech.

Ex-President Wm. Conway, Philadelphia, Pa.

Vice-President Clippert in the chair: What is the next, Mr. Secretary?

Secretary Randall: I have here a telegram which I think you will listen to with some interest. There was a time when this telegram would have caused a good deal of turmoil, but it is right along the subject we have been discussing, that of getting together. The spirit of getting together is abroad in the land, and I think this will find a responsive chord in the hearts of many of those present. It denotes a spirit of progress in the brick industry. It is addressed to me as secretary and reads:

The National Bricklayers' Union Offers Co-operation.

Indianapolis, Ind., March 7, 1917.

T. A. Randall,

Secretary National Brick Manufacturers Association,
New York City.

In a conference this afternoon with Mr. Rorick, of the "American Builder," he reminded me that your Association begins its annual convention today. Regret exceedingly that I cannot be with you, but hasten to extend the wish that it may be the best meeting you have ever held. We all know that clay products have a wonderful future in building construction, and now that the building trade press has become interested and is doing such splendid work, it seems to me more can be accomplished in a few years by taking advantage of the opportunities thus offered than could otherwise be made in a generation. The Bricklayers and Plasterers' Union of America is in entire accord with this movement and is lending its active support. There need be no shortage of skilled mechanics to lay brick in any community. The international union officials will furnish skilled men wherever they may be needed. Call on Indianapolis headquarters for such assistance whenever and wherever the need arises. No manufacturer of brick need hold back for fear there will not be building mechanics competent to lay his material. Let us unite to dispel any such impression that may prevail.

THOMAS R. PREECE, First Vice-President.

Chairman Clippert: Are there any remarks on this telegram?

William Conway: As every one knows, there is no building commodity selling at so low a price according to its value today as brick. The thing that has caused the most trouble and added to the cost of buildings is the cost of laying brick. Not only is the bricklayer the highest paid mechanic in the land, but the restrictions of the union has kept down the number of apprentices until the supply of bricklayers is insufficient. If the union will remedy this fault the brick industry will profit by getting together with them.

William K. Hammond: In regard to that telegram, I think that is one of the most important things that could come before this convention of brick manufacturers. Without the services of the bricklayers, it is vain for the manufacturer of brick to put his brick upon the market. I am reminded of a time, fifteen or sixteen years ago, when the subway went down Forty-second street and down Broadway. John MacDonald was the contractor and intended to use a lot of brick, and finding that he could use to advantage in some places fire-proofing, and he could use his cheap labor to stack them up, he started to work along that line. His bricklayers came to him and said, "We want to lay that fire-proofing." Mr. MacDonald said to them, "Don't talk like fools. I can do this work much more cheaply with these $2.00 fellows than with you fellows," but they said, "If you don't let us lay that fire-proofing, we won't lay any of your brick." MacDonald said, "There won't be a damned brick used in this tunnel," and he came pretty near keeping his promise. There should be co-operation between the brick manufacturers and the bricklayers. The bricklayer today holds the brick manufacturer from success in the city of New York. That is the case. Not because he strikes. The bricklayers is the best managed union we have today. There is something that lets other material be substituted, and that other material when substituted is what is hurting us today. I would ask that in the wisdom of the Association you put other brick manufacturers in touch with the information that these men have offered co-operation. Let us put them to the test, and see how far they are willing to co-operate. If that meets with your approval, I think we will make progress. (Applause.)

Chairman Clippert: I am very glad indeed that Mr. Hammond started this discussion. I think that is a very important telegram.

Mr. Mayer: If I am not mistaken, we have had that same subject up before, and at one of our conventions we had a representative at one of the sessions, and he promised what they were going to do. And they did co-operate with us, so that when we sold brick for $6.00 they got $7.00 for laying them. You know there was a time when the bottlers of this country dictated how long they should bottle, and whose son should learn to bottle, and how long they should be apprentices. You know the Glass Blowers' Union was one of the strongest in the country. They over-reached themselves, and now you hear nothing more of them. They became so arrogant that manufacturers were obliged to adopt machinery to take their place. In our neighborhood, these fellows give orders. "We get $5.50 a day and we work eight hours, and we don't allow scabs here," and they get what they want or they don't lay the brick. I think the brick business would accomplish the most wonderful thing for the industry if we could get rid of that menace.

Mr. Burton: I have given that subject a great deal of thought. I have been humiliated by having to hire bricklayers when I had men on my plant who could do the work better. We have a right to teach the men to lay the brick as we want them—let them belong to the unions or anything else. As Mr. Hammond says, if we cannot get the bricklayers, we might as well not make the brick. We cannot prevent men from getting into the brick business, but yet we are preventing teaching the boys how to lay brick.

Henry B. Loveland, Jewettville, N. Y.: I like the kindly advance made by this union, and I move that our secretary be instructed to reply in a proper way to that telegram.

R. G. Eisenhart: I second the motion.

Carried.

Secretary Randall: Ex-President Deckman reminds me that I neglected to say that the smokerette this evening will be held on this floor in what is known as the "winter garden." No ticket of admission is necessary, just the badge of membership.

Chairman Clippert: Before we adjourn, I would like to ask that you be in your chairs tomorrow morning at 10:00 o'clock. I think you all know there is to be but one session a day, and we must get an early start. If there is nothing further, the meeting stands adjourned for the day.

SECOND SESSION.

Thursday, March 8, 1917—10:00 A. M.

President Salmen: Gentlemen, you will come to order. The secretary will please announce the first on the program this morning.

Secretary Randall: We have a very interesting and busy forenoon ahead of us. The first number on today's program is a paper by C. B. Platt, of Van Meter, Iowa, on "Economic Competition Through Associations." Mr. Platt is unable to be present, but he has sent a copy of his paper, and Mr. W. E. Dunwody, of Macon, Ga., who is to lead in the discussion of the paper, has kindly consented to read the paper and then lead in the discussion of same.

President Salmen: I like to call on these southern men, and I am glad to introduce Mr. W. E. Dunwody, of Macon, Ga.

W. E. Dunwody, Macon, Ga.: Thank you, Mr. President. I thought for a little while there that I had lost my manuscript, and was in the position of the Methodist preacher who, when he went into his pulpit one Sabbath morning, began looking for his manuscript, and he could not find it after examining every pocket in vain. He said, "Well, brethren and sisters, I find I have no manuscript, so we will have to depend on the Lord this morning, but I will try to do better the next time." (Laughter.) I have a letter which I received from Mr. Platt a day or so ago, in which he stated that he had hoped to be here, but they are making some changes at the plant and he decided he was needed at home. He was kind enough to send me a copy of his paper, so I might be prepared to discuss it intelligently.

ECONOMIC COMPETITION THROUGH ASSOCIATIONS.

BY C. B. PLATT, VAN METER, IOWA.

Mr. President and Gentlemen of the Convention:

Co-operation between producers within an industry, to in a measure regulate destructive competition, is no longer a serious offense.

The government has forced co-operation upon the railways for the purpose of accomplishing an end which was calculated to benefit the public and at the same time to save the railroads from the greed of their favored customers.

The government also sanctions most restrictive co-operation as practiced by labor organizations and it endeavors to serve the agricultural industry in every possible way to establish its permanent prosperity.

It is a pretty generally admitted fact that the soft coal industry was saved from the rocks of unrestricted competition by adopting the principles of co-operation.

The clay products industry has, for reason of a lack of co-operation between producers, been unattended by success, and though there are many successful plants, it is said that only 2 per cent. of the capital invested in the industry has paid dividends. If this statement is true, and there seems to be no marked evidence to the contrary, a change should prove quite acceptable to a pretty fair majority of the clay products manufacturers.

It has been rather an easy matter to interest capital in the manufacture of clay products and yet, it is not an industry which attracts general investment funds.

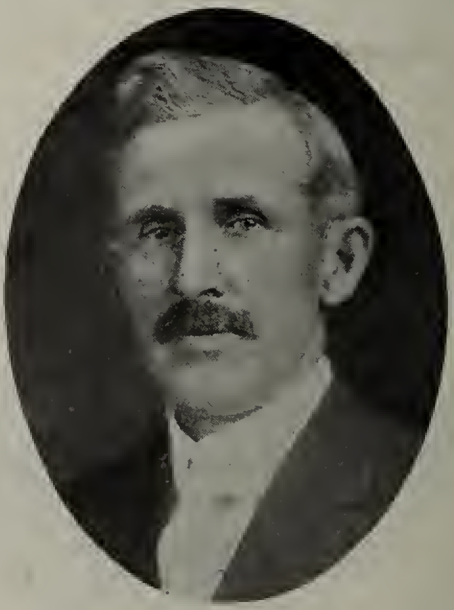
Speculative investments, in what are known as "promotion" schemes, have not resulted in anything but a loss and this harmful venturing has no doubt been effectually discouraged.

Should it happen that the demand for clay products were strongly developed through co-operation between producers to several times its present magnitude, it is likely that increased production would have to be largely provided through a reinvestment of profits, or through the use of the personal funds of those now interested in the industry. There does not appear to be any danger likely to develop from a rush of capital to our industry, even following an increase of 1,000 per cent. in the *average* income from such investments.

The clay industry has reached a point where it needs help. The situation is quite similar to that which was present with the railroads before the government stepped in and saved them from the greed of their most favored customers, the rapid growth of which the individual organization could do nothing to stop.

The day when the government will intervene to effect economic competition within industries serving a comparatively small proportion of the public, is probably in the far distant future. There is no way of escape from the rapid development of destructive competition as available as co-operation in the development of a sane regulation of trade practices, which will result in the common good of the industry and the ultimate users of the industry's product.

Co-operation will lead the large producer to the mountain top where he can see spread before him a world of possessions which are offered him at a price quite insignificant as compared to the reward. This price is simply that he be willing to let the small producer pick up the crumbs which fall from the rich man's table, and distribute the favors developed in competition among the users of the product, rather than to allow all development of the trade to rest with the intermediate buyer, and all the profits of consequence in the trade to be absorbed by him.



C. B. Platt, Van Meter, Iowa.

Co-operation to effect economic competition is a concerted investigation of prevailing conditions, conducted by those who have taken a treatment of self-analysis.

It is essentially a demonstration of a friendly state of mind which admits of the possibility that the blame for existing conditions does not rest altogether on the shoulders of the other fellow.

In considering the medium of friendly co-operation, the *Trade Association*, it should be looked upon as a means of bringing up friendly discussions.

Friendly relations should first be established between those who compete directly, and so the trade association should follow the districting of market zones.

Each of these market zones should have its association.

Friendly discussions are suggested on the following subjects:

1. *Distribution.* A discussion of this subject may develop a conclusion that there are too many conflicting agencies employed and that these are largely responsible for the fact that in most any producing district there may be found at least two producers who are ready to spring at each others financial throats.

2. *The possible Extension of Co-operation Between Producers in Different Market Zones,* the lack of which is noted in the tendency of the distant producer to make a dumping ground of the distant market, in which he feels no permanent interest.

3. *Market Saturation.* The admission that there is overproduction, leads easily to the conclusion that selling prices should be lowered, regardless of high cost conditions. Friendly discussions of this subject contain great possibilities.

FORMING ASSOCIATIONS.

There are admittedly a few difficulties attending the formation of trade associations. First among these comes the establishment of friendly relations between old time enemies. Pride holds each from taking the initiative.

This difficulty might be overcome through a little unselfishness on the part of one or two in each district who would be willing to take upon themselves the responsibility in hiring an organizer who would undertake to organize into a friendly group at least 60 per cent. of the producers in the district.

Once organized, with even a 60 per cent. membership, growth would be rapid, and a wide field of endeavor containing wonderful possibilities would become apparent.

Without entering into detail, we may name some of the possible activities of the association as follows:

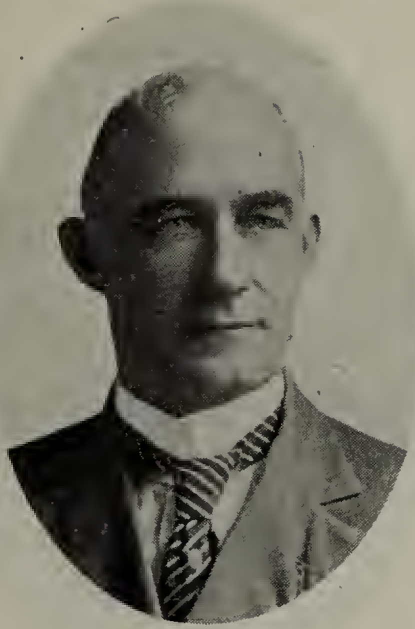
1. *Universal Cost System.* A cost system could be devised and used by all members which would result in data that could be used in the determination of a reliable *average cost* in each zone of production. This average cost could, if desired, be determined with entire secrecy respecting individual costs, if each member's report were sent to a dependable auditing company and it in turn report the result to the secretary of the association who would communicate it to the members.

2. *Engineering Department.* The association could establish and maintain a department which, among other things, could work out stock plans for small cost useful buildings. This line of structures contain the great aggregate demand. This department could also devise plans calling for the use of clay products where not previously considered.

3. *Credit Rating Bureau.* The association could establish a commercial rating for a list of dealers, based on the records established through dealings with the members reporting. This could include not only their apparent responsibility but their conduct with respect to prompt payment and demands for special concessions.

4. The association could bring about a practical standardization of products and it could assist in the establishment of specifications following tests of materials.

5. The association could, from data furnished by its members, furnish dependable estimates of the possible supply of a given product within the market zone and indicate to what extent it had been called upon in the year previous.



D. Warren DeRosay, Corry, Pa.

6. The association could largely influence the forming of favorable building codes.

7. The association could establish a boosting tendency among its members which would result in the disinterested demand for the use of clay products in public work and which would establish reciprocal relations between producers of differing products of clay.

8. *Demand Building.* Above everything else in value, the association possesses the proper channel through which to conduct a demand building campaign. This is true because of the fact that its assertions made to the public would be free from personal references which carry comparisons of clay products, and because its comparisons are between clay products as a whole and substitutes offered in the market.

In the association's appeal to the consumer there should be apparent a strong interest in the welfare of the public. Therefore, it is suggested that the public title of these associations be such as not to indicate a one-sided interest.

While the producer is always more or less public spirited, his first interest is naturally selfish and he should, therefore, not be asked to strongly support any publicity movement in a market in which he can not hope to operate. The proper idea seems to be to intensify local advertising effort and to lend some assistance to the wider efforts.

As is the case with the individual advertiser, the association should not start demand building with display advertising, but should first provide an extensive and exhaustive line of educational literature.

The different zone associations could co-operate in an exchange of advertising literature and thus greatly reduce the preparatory expense. Such an arrangement would help establish a federated interest which would prove beneficial in many ways.

In emphasizing the importance of trade zone organizations it is not intended to suggest a curtailment of interest in the major organizations. These would, without question, be strengthened through the active existence of the minor organizations and in turn they would serve to bind the zone organizations in a common interest and to insure their permanence and growth.

SOME UNFOUNDED OBJECTIONS TO ASSOCIATIONS.

1. *Unlawful Price Agreements.* Co-operation through trade associations does not have in view the restriction of trade nor any specific price fixing agreements.

The idea is to make competition a broad and constructive effort in trade building through constantly improving service, rendered at figures consistent with the cost of production.

The users of clay products should feel that they were being very fairly treated, and receiving their just due from the benefits of competition, when they are able to buy at a figure which approaches closely to the *average* cost of production within the industry. The industry as a whole is the public servant, worthy of his hire.

The purchaser has no claim against the individual producer in a division of his profits represented between his individual cost and the average cost in the industry.

This extra profit is as justly due of the manufacturer who makes it, as is the extra wage paid the skilled artisan over that paid the common laborer, the just due of the artisan.

2. *Absolute Independence Lost.* There is some question regarding this claim. If there is a foundation for it, there is perhaps no comment necessary aside from a question—Is it worth the cost?

3. *Objection to Change of Established Custom in Distribution Policy.* This objection is offered against recognizing but one division in the distribution of product between the producer and the actual consumer and the restriction of wholesale prices to apply only in case of sale to the recognized dealer, regardless of the size of the order.

There does not appear to be any good reason why the manufacturer should hold to the practice of using a set of conflicting mediums through which to distribute his products when these have proven to be the most prolific source of price wars.

It does not seem that it would prove to be an economy for the consumer to buy direct from the manufacturer because the extra cost incident to the cost to the manufacturer in locating the consumer would be greater than the profit of the local dealer. This cost to the consumer, represented by the reasonable profit of the dealer, should be as fixed as the cost of delivery by the carrier. That is to say, the consumer should profit directly as the producer's price varied.

As matters stand now this does not occur. The producer is tempted to sell in large quantities at a low price and the buyer does not profess to pass his buying skill on as a benefit to the consumer. This low price is anything but confidential and is in fact used as a lever in securing a still lower price from some other producer. The influence does not stop here as these special prices become the prevailing price soon after and remain in force until again lowered through the same method.

Dealer interest is thus confined to petty sales at small profits and in consequence we find that the dealers in building materials are not anxious to work with the consumer to induce him to use clay products.

In order to secure the co-operation of the dealer in business building he must be assured a profit and be able to figure on every local job.

If investigation develops that there are buyers of clay products who resell at a profit and who are not dealers and are not exerting any effort to induce builders to use clay products, why should they continue to be favored customers, who are in fact, dictators of our sale price?

POSSIBILITIES IN GROWTH OF DEMAND.

Considering the demand for clay products in building operations, let us analyze the situation in one of our great agricultural states.

The last Geological Survey Report credits the state under consideration with a clay products production value of *six and three quarter million dollars* in the year 1915. Of this total, 56 per cent. was represented in the value of *drain tile* produced.

During the same year there was a *decrease* in the production of clay building materials, notwithstanding the fact that the state enjoyed unusual prosperity and did an immense amount of building.

Looking into the supply conditions in this same division of production, we find that there was an apparent overproduction and that the selling price at which the majority of the product was marketed, was below the average cost of production and delivery.

Here are the demand possibilities.

The state's population is equally distributed. There are really no large cities. There are many prosperous little cities between 5,000 and 10,000 inhabitants, a dozen or more over 15,000, two or three exceeding 30,000 and one exceeding 100,000 inhabitants. There are hundreds of small and prosperous towns, all building and nearly all undersupplied with low rental homes. Of the thousands of residences being built annually in these cities and towns, nearly all are frame construction. There are a good many constructed with outer walls of stucco on lath and a *few* constructed with hollow tile and brick.

These towns pave with asphalt and cement.

Considering the farm building field. In this state farm building improvements total $40,000,000 annually.

The farmer thinks little of any construction aside from frame and cement. Why? Because no one has told him (prior to the past year, when the local association instituted a campaign of education) about clay products, excepting the individual producer of brick. The farmer has naturally considered this source of information as somewhat prejudiced. The local dealers in building materials boost other materials because they are protected in their profits. The papers have not learned about clay products, and know of nothing but lumber and cement.

It would seem to be a conservative estimate to place the cost of the walls of farm buildings at 25 per cent. of the total cost of the structures. Assuming that there would be no clay products used in these structures excepting in the walls, in a total expenditure for farm buildings amounting to $40,000,000, we would have a possible market for $10,000,000 worth of clay products. This would be over three times the amount represented in clay products building materials produced in the state where this market exists. It is probably a conservative estimate to place the total urban market value of wall construction in residences alone, equal to the farm construction value in walls of farm structures. Here is, in these two sources of demand, an available market which would consume nearly seven times the total production value of clay products building material, if turned from other materials to brick and hollow tile. Surely this market is not saturated. It is being found to be worthy of co-operative cultivation. This state is not in a class by itself. It probably represents the average market possibilities in any state of its size and stage of development.

Shall we pass by these open doors and abandon the fields to more progressive cultivators, or shall we organize in a co-operative effort to secure this demand for clay products? (Applause.)

General Discussion.

Mr. Dunwody: To get down to the discussion of this paper, I do not feel much like getting down to work, and I want to take this opportunity on behalf of the Georgia delegation to thank our New York friends for the delightful entertainment of last night.

My experience since I have been in New York has led me to believe that a Georgia "cracker" cannot tell New Yorkers much about the subject of prices. (Laughter.) There is this much to say, however, that the people up North have had a very decided influence in raising at least one element of price, and that is the cost price of our brick in the South. You do that by taking away from us quite a large number of our darkies. Labor is scarce in the South, and it is the result of the great exodus of negroes to the North and West. By the way, as I was walking down the street yesterday morning I met a colored friend of mine, and he seemed glad to see me. I said to him, "Jim, did you bring Carrie with you?" "Yas sir, yas sir, I done got her with me. How are you feelin' this morning, boss?" Well," I said, "I don't feel very well; they keep me up too late in New York. How are you feeling, Jim?" You know these darkies have a lot of originality. He replied, "Well, boss, I ain't feeling like no power house myself." (Laughter.)

I met another friend since I have been in New York, whom I had not seen for some time, and he said, "Hello, Bill." I said, "Howdy, Jack; it has been some time since I have seen you. Are you married?" "Oh, yes; I have been married about two years and a half." "That's fine," I said, "I want to congratulate you. Have you any children, Jack?" "Oh, yes; five." (Laughter.) "Five," I said. "How's that?" "Well," he said, "you know I am in the railroad business, and when we were married we went to the Twin Cities to live, and the year we lived there we were blessed with twins. Then the railroad company moved us to Three Rivers, and there we had triplets." (Laughter.) I said, "Jack, I congratulate you on such a fine family." He replied, "Well, Dunwody, I don't know about that. I would not lose any one of these children for anything, but in these hard times and high cost of living, I don't know whether it is a source of congratulation or not." I said, "Jack, I was just thinking what a fortunate thing for you it was the railroad company did not move you to Thousand Islands." (Laughter and applause.)

But all our trouble cannot be "little ones." We had a very eminent Methodist evangelist in our state (Sam Jones, most of you have heard of him) once in discoursing on the subject of divorce, he was enlarging on the terrible prevalence all over the United States of divorce, and said he had gone down to the court house and found that in less than six months there had been 135 suits filed for divorce. But he said, "The course of true love never runs smooth, and all married couples have their little differences." "I wonder if there is a man in this audience who never spoke a cross word to his wife. If there is, let him hold up his hand." An old man in the back row held up his hand, and Mr. Jones said, "Come up here; I want to shake hands with you." The old man went up and Mr. Jones shook hands with him and said, "This is a great pleasure. I want you to turn around and face this audience. I want this fine audience to see the biggest liar in the state of Georgia." (Laughter and applause.)

It seems that we have been divorced from the sort of profit to which we are entitled in our business, and it is this I am here to discuss this morning. We have been operating without co-operation for a number of years. We have been trying that plan a long time, mainly influenced by selfishness. But, you know, wise men change their minds sometimes; fools never do. I gave this matter quite a little thought and came to the conclusion that the remedy for the poor condition of the brick business in Georgia was co-operation; that we must get together. We have an enormous amount of time, energy, brains and money invested in the business, more than in many other lines that are succeeding, yet we were getting no results. Co-operation must be had, but co-operation was impossible without organization. Organization is impossible without confidence, and confidence cannot reside in the same house with selfishness. The best illustration of this, I think, is given in the motto of the Rotary Club, which is the motto that business men generally should adopt.

"He profits most who serves best." (Applause.)

But some will say, "Oh, Dunwody is dealing in glittering generalities; why doesn't he give us something concrete?"

Just be a little patient; I am coming to it. Two years ago, after an experience of twenty-five years, the business growing in quantity of output, I found that no Georgia brick manufacturer was making as much money as his efforts entitled him to. Upon investigating the reasons, I concluded we had the wrong viewpoint. The trouble was not due to lack of capital, lack of modern methods, lack of experience, or lack of energy. Each of us was trying harder to keep the other fellow from making money than we were trying to succeed ourselves, and in this ridiculous effort each one of us was dangerously near to 100 per cent. efficient. (Laughter.) That's a fact! No one was showing a profit at the end of the year. We figured how near we had come to the precipice of failure without falling over. We tried to manufacture at low cost, not to increase our profits, but in order to undersell our neighbor in the same line of endeavor. Each one tried to increase his own sales by decreasing the number of brick sold by his friend, the brickmaker across town, or in some other town, instead of increasing our business by educating the public that brick is the best building material. Education enriches, ennobles and makes powerful. A man who educates himself increases his own confidence in his own capabilities. The same energy that we used in fighting our fellow brickmaker would, if put in the proper channel, increase his sales and our own as well. As we were doing business, it was every man for himself, regardless of any one else, and no one had any respect for us. Prices were cut and it was the brick men who had to pay the cost.

W. E. Dunwody, Macon, Ga.

This realization of the conditions brought home the fact that something was wrong, and something had to be done. The question was, "what to do" and how to do it.

I began by visiting all the brick manufacturers in my locality, and getting acquainted with them. Then I called a meeting in my own home town. We broke bread with one another and "cussed and discussed" the business, past, present and future. The result was that we decided on the following things:

1. Not to sell any brick without profit.
2. That no one of us could sell all the brick, and we would not if we could.
3. That it would be better to sell less, if by so doing we could make more profit.
4. To use the same effort trying to sell at a profit that we had been using in trying to see how close we could sell them without failing.

We now meet every thirty to sixty days, and have a friendly competition each time in deciding who shall be host for the next time, whereas formerly, no one was particularly welcome on the other man's plant.

The results are that we are better brick manufacturers. We are better men, and we are better friends, in the true interpretation of that beautiful relation, and we are realizing some profit.

Can you do this? Yes, you can. You must expect it to take some effort, but with the proper sort of effort nothing is impossible.

How can this help all? Each state should organize and then the secretaries of each state association should organize. We all know and recognize the truth of the old adage that in unity there is strength. The strength of organization is shown by the recognition of our National Brick Manufacturers' Association here in this great city. Mr. Hammond spoke of the benefits of co-operation between organizations, and who can question the power for good exerted for its members by the N. B. M. A.? Only those who are not members. Take it home to them, help them and they will help you, and keep ever before you the motto of the Rotarians:

Thomas E. Wilson, Pittsburgh, Pa.

"He profits most who serves best."

Finally, gentlemen, I would say to you, follow the lead of the world, or that part of it which is doing things. I have forgotten to say anything to you about standardization of methods. However, that would be obvious. Get your organization and all these things will follow. Let me mention one thing your organization should do, and that is, start a campaign of advertising.

Last year, the Georgia Brick Manufacturers' Association raised a fund of $6,000 to advertise the utility and economy of brick to the people of Georgia. This is not a large sum, but it is a start, and it has convinced us of the desirability of work along these lines. If every state would follow suit, we would have $288,000 a year to begin with, which would have a wonderful effect upon the market for brick in the United States.

Will it go?

A story is told of an old man and his son who lived back in the bushes in Georgia. You don't have anything like that up north. We have some people living way back in the bushes who have never seen an engine. This man I speak of and his son came to Macon one day and saw their first locomotive. The old man looked in surprise at that ponderous mass of iron and steel and brass, and he said, "Boy, Lord Almighty can't make it go." Finally he saw the engineer climb into the cab, grasp the throttle and give her steam; saw the connecting rods begin to move back and forth, then the ponderous wheels begin to turn and the engine moved. The old man stood speechless until the whole train had moved almost out of sight, gaining speed all the time, and just as it rounded the curve, leaving only its trail of smoke and steam, and turning to his boy, said, "Boy, all Hell can't stop it." (Applause and laughter.)

President Salmen: Gentlemen, this is one of the most interesting topics we have ever had on our program, and I do hope we will have a great deal of discussion on same. We will limit each speaker to three minutes and no speaker will be heard more than once, except at the pleasure of the convention.

Friends vs. Acquaintances.

Wm. C. Koch, St. Paul, Minn.: Mr. Dunwody has spoken about our friends in the brick business. Of course, we have a good many of them in the brick business from start to finish. Of course, we can make friends and stay with them. But we have a lot of acquaintances; what are we going to do with them? Clay deposits are pretty promiscuously scattered throughout the country, and it seems the popular impression that brick are about the easiest thing to make. What are we going to do with our acquaintances, a lot of people who don't know anything about brick? They think they can make a fortune in a few years.

Mr. Dunwody: Example is better than precept. We have some acquaintances, but they are getting fewer every day. I don't mean to answer lightly. There are some things we must take on faith, just as sure as you are living. If you set these fellows a good example, make up your mind to continue setting them a good example; strange as it may seem, you will soon win him over. If you don't win him over, just ignore him. You are not going to sell your brick without a profit. He cannot sell them all. Salesmanship is what controls, and you can sell anything if you put all your mind and your energy and thought behind it. I will sell anything any man gives me to sell. Have more confidence in yourself as a salesman and more confidence in your fellow man, and don't let price be the controlling factor.

Organization Work in Pittsburg.

Thomas E. Wilson, Pittsburg: I did not come with the expectation of saying anything on this subject. I am like Mr. Dunwody, I have lost a lot of sleep since I came here, and I will not be able to speak more than three minutes, anyway. Our experience at Pittsburg in organizing has been, in the first place, to get the manufacturers to know what it has been costing them to make brick. Four years ago we organized the Pennsylvania Clay Club, and, by the way, I notice that is the only Clay Club that has made a contribution to the Building Show here in New York. We thought it worth something, and sent $100. No matter how they spent it, we took it for granted they would spend it correctly.

Four years ago last January, we called together the brickmakers of Pittsburg and vicinity. I think we had about seven at the first meeting. Our secretary is here and can substantiate what I say. When we got into the meeting, almost every one had to be introduced to the other, although they had been in business some twenty or twenty-five years and had never wanted to know each other. We did not try to fix prices. The first thing we did was to get them to agree to make the same size of brick. Some of them were making a brick big enough for a paving brick, and using that argument to sell their brick. We got them to agree to make the same size brick. Of course, the clays will shrink somewhat differently, but we now all make the same size of building brick, the common red brick. After that was accomplished, these people who had been making large brick saw they were making quite a gain without raising the price, by simply cutting down the amount of material, taking less kiln room and less fuel to burn them with.

What it Costs to Make Brick.

The next thing was to get them to tell us how cheap they could make brick. At first they did not want to give their names. I remember one firm put in their price at $3.60. I happened to be chairman of the meeting, and I wanted to find out who that party was, because we wanted to employ him. Finally, one of the fellows said, "That's my price." I said, "You never made a thousand brick for that price in your life," and he explained how he did it. His partner was superintendent of the plant. Of course, they did not have to pay him anything, and the man himself was burner, and he did not draw any salary, and by the time he got through he confessed that the way they made the brick at that price was because the whole family worked for nothing. And the plant was wearing out, not allowing anything for depreciation. We convinced him very shortly that it was costing him $5.50 to make his brick and put them on cars. That was several years ago, when fuel was cheaper. He said, "Well, I have been selling brick for some time for $5.00, but I bet I won't do that any more." When men find out they are selling their brick for less than it costs them to make them, they will quit it without agreeing to any particular price.

So our membership grew among the brick manufacturers of Pittsburg, and we would discuss what we were getting for our brick, and the price kept growing, and we did not try to go into another man's territory and cut his price and take his business. We realized that every plant was entitled to the benefits of its locality. I always said and I think others felt the same about it, if I ever go into another man's territory at a less price than he is getting, I want him to let me know. I would have the freight rate against me. He would have a low freight rate, perhaps 40 cents a ton, while my freight rate would be 75 cents a ton; yet I would be going into another man's territory and getting a less price.

No Price Fixing Necessary.

Another thing we discussed: A contractor would call up and say, "I want to give you an order for 100,000 brick if you can meet the price." We say to him, "Well, if the other fellow can afford to sell his brick for 50 cents less per thousand, you can give him the business; we cannot afford to." And I do not think anyone else can, because they cannot make brick any cheaper than we do. Most of the time we get the order. It proved the contractor was simply "stringing" us. He simply used one brickmaker against the other to break down prices, and the brickmakers were foolish enough to believe it. We do not care now how many orders our competitors get. I always say I want my competitors to make all the money they can out of this business, and all they are entitled to. All they can get, and I hope they will make at least $25,000 a year, for then perhaps I can make $10,000. But if your competitors are not making anything, rest assured you cannot. The price four years ago in our locality was about $6.00 per thousand. At first we got $7.00, then $8.00, and now we have all the orders we can get, and have had since December first, for common building brick at $10.00 and $11.00 at the plant.

I want to say this without taking any more of your time. We have a very harmonius club. Our attendance is very large, I mean for the membership. Our membership is something like twenty-seven or twenty-eight, and we will have sometimes as high as twenty-two to twenty-four in one evening. We meet once a month at the Fort Pitt Hotel, and the companies pay their quarterly dues whether they come to the dinner or not. The dinner costs us $1.25, and they miss a good dinner if they do not come. We discuss the methods of making brick and the kind of power to use, and in a general way the discussion is for the benefit of all, and, as Mr. Dunwody has said, we number among our best friends the brick manufacturers of our vicinity. We don't call them competitors any more. It never worries me to hear of my fellow brick manufacturer getting an order for a million brick. I congratulate him, because I know when he is filling that order, he won't bother the next one that may come up. I think the brick men in every community should organize and get together, and the price will come itself without any fixing of prices. Everybody wants everything they can get for their output, and this is the method that will bring it about. (Applause.)

Will P. Blair: There is one thing I want to speak about aside from the subject under discussion. I have observed a number of gentlemen, when talking, speak about the National Brick Makers' Association. There is no such association. We are the National Brick Manufacturers' Association. Now, concerning the question under discussion, it is very apparent that every one here is united in sentiment and in the conviction that the brick manufacturers of this country ought to do something for themselves. Now, what is the trouble? It occurs to me that out of the discussion that takes place in the meeting, and out of all the philosophy that we get in the literature of the past, that we can find that which will cure the thing that gives us the trouble. We are all agreed, but we haven't the courage—at least the staying qualities of our convictions. We do not exercise the philosophy we proclaim. We do not follow our own advice—after we get home. We seek to secure some particular single job, and seek it with such energy that we sacrifice price, our own interest, and forget entirely the welfare of our competitor in our anxiety for the single particular sale. Then, too, we forget all about the great influential customer—the public. While our individual customers are made up of individuals on the one hand, we can have but few of them unless through a united public favor. I sometimes wonder why, on going home, we entirely forget what we here, in common agreement, say we must have—that public favor. Can we not keep in mind to bring the public of this country to the favor and use of brick by continued, constant and persistent effort? Thereby serve the common good of all and yet make certain the interest of each.

B. H. Richards, Edwardsville, Ill.

B. H. Richards, Edwardsville, Ill.: The gentlemen who have been talking have been talking about common brick and the competition between common brick. I see so much greater difficulties in these associations and getting things standardized where the competition is not only between common brick, but between common brick, culled pavers, building tile and other clay products. I would like to ask Mr. Dunwody if there were any other than common brick manufacturers to get together in Georgia.

Mr. Dunwody: Our main competition in our Southland is with cement construction, reinforced concrete. But the time is coming when we will have competition with hollow building tile, and just as soon as we have enough competition with the hollow building tile, I expect to carry out the same principle and manufacture hollow building tile. I am pledged to clay products, but if the people want hollow building tile, they are going to get them from the Standard Brick Company.

I am going to give them the same thing they can get from other people.

Mr. Blair: I would like to ask Mr. Dunwody whether or not in Georgia they have enough competition outside of clay products to keep them busy?

Mr. Dunwody: Yes, sir; we have.

Co-operation Between Different Branches of the Industry.

Mr. Elisha K. Kane, Kushequa, Pa.: There is a feature of this Economic Co-operation Through Associations that connects itself very intimately with the National Brick Manufacterers' Association. We have in each branch of this business a thoroughly organized and very effective association. It would be a very serious mistake, it is a very serious mistake, when any of the subsidiary associations attempt to leave this parent body and go out into a far country and waste its substance in riotous living, as it were. As a rule, where they get separated in that way we have danger of this kind of trouble. The question was, what shall you do with this other competition? and the answer was, make some of the other fellow's product. In other words, "but" into another branch of the clayworking business with which you are not familiar; break up the other fellow's business perhaps with your competition so as to relieve it in this particular line. We want to get away from that sort of co-operative selfishness, a misapplication of the Golden Rule. It makes the Golden Rule apply only to one branch of the trade, instead of to the entire trade, and the way of escaping from that we get by the meetings of this general association, for here we can meet with all who make every kind of brick and clay products, and in the touch of the shoulder, the personal contact, be greatly benefited. The man who is making face brick can suggest to the common brick man to please be careful how he selects our common brick to smash the market for face brick; and the man who makes common brick can suggest to the face brick man, please be careful how you put into the common brick market your seconds. We need to get together in a better way, with the subsidiary associations working with us as well as by themselves.

A. V. Bleininger, Pittsburgh, Pa.

President Salmen: If there is no further discussion on this subject, we will pass on to the next, which I will ask Mr. Randall to announce.

Secretary Randall: The subject and matter of this discussion we have just had is alone worth the time and trouble and expense every delegate has been put to to come to this convention. The next number on the program is a paper, "Properties of Structural Clay Products," by Professor A. V. Bleininger, of the Bureau of Standards, Pittsburg. Professor Bleininger needs no introduction to this audience. (Applause.)

THE PROPERTIES OF STRUCTURAL CLAY PRODUCTS.

BY A. V. BLEININGER, PITTSBURG, PA.

Mr. President and Gentlemen of the Convention:

The question of the physical properties of structural materials is receiving more and more attention at the present time. This statement applies especially to steel, the various alloys, concrete, both plain and reinforced, but only in a limited measure to clay products. The materials represented by this and allied associations have not been studied upon a comprehensive scale and have been sadly neglected by the engineering profession. It is only recently that such organizations as the American Society for Testing Materials and the bureau which I have the honor to represent have engaged in more elaborate investigations. This condition is not a healthy one, and is largely responsible for the lack of knowledge exhibited by architects, engineers and technical schools concerning the general subject of clay products. The same condition has been the cause of many misunderstandings and considerable prejudice against these products in comparison with more recently developed structural materials, especially concrete, which by many is considered the ideal achievement. There can be no doubt but that a more accurate and broad fund of information concerning the properties of ceramic products would assist greatly in removing many prejudices. At the same time, this knowledge would help us overcome certain defects which we know to exist and cause us to strive toward the development of new designs of bricks, tiles and other shapes made from clay and their most advantageous utilization. That the condition described above is not exaggerated is easily shown by pointing to the competition between building brick and concrete, between brick paved and concrete roads, between clay and concrete drain tile, between vitrified sewer pipe and concrete pipe, between clay and silica brick, and between clay and other types of fireproofing.

To know the whole truth regarding the properties of our materials will mean the ultimate maximum growth in their use. At this point the statement might be heard that our manufacturers already know all about their product and that such an extensive study is really not necessary. One does not hear such statements in the concrete camp. There it is fully realized that a great deal is still to be learned regarding concrete and that all such investigations have a real money value. The fact is that we do not know much about clay products, and still less of their future possibilities. The structural possibilities of clay products, their use in different forms and with mortars of the proper strength, offer a wide field for the architect and the engineer.

In this paper the writer desires briefly to review the different properties of clay materials, citing practical examples in which a knowledge of the various facts are desirable.

CRUSHING STRENGTH.

Bricks and building tiles are to a large extent subjected to compression in use, though it must not be forgotten that cross-breaking stresses are very common in buildings, especially during the settling of foundations. As it is easily made, the crushing strength of bricks is usually taken as a measure of their quality. It is realized, of course, that but a small fraction of the crushing strength is actually used in building operations, since even soft burned brick are amply strong to resist the crushing action to which they may be subjected. Assuming that we are dealing with a medium-burned brick, possessing a crushing strength of 3,000 pounds per square inch, and that the mortar possessed equal strength, we could erect a structure about 20,000 feet high before ultimate failure due to straight compression took place. In reality, we must also consider the cross-breaking effects due to the unequal distribution of the load, which are noticeable even in buildings of ordinary height.

The main use of the crushing strength test is to differentiate between good and poor bricks, for which purpose it has a legitimate application. It would be absurd, however, to carry this differentiation too far. To say, for instance, that a brick showing a crushing strength of 12,000 pounds per square inch is much superior to one possessing a strength of 10,000 pounds per square inch is absurd; on the other hand, one showing a strength of 3,000 pounds per square inch is certainly to be preferred to one with a strength of 1,000 pounds. The committee on brick specifications of the A. S. T. M. has given considerable attention to the crushing test and its tentative requirements in this connection will be given subsequently.

Several years ago the bureau made some tests for the purpose of determining the maximum compressive strength it is possible to obtain with the several types of clay molded on the auger machine. For this purpose 3½-inch cubes were made, which were burned to several temperatures, their porosities determined and their crushing strengths obtained. Care was taken to grind the ends to make them truly parallel. The results obtained are shown in the diagram of Fig. 1. Here the curves numbered 26 and 37 represent surface clays; Nos. 34 and 35, shales, and Nos. 32 and 33, second-grade plastic fire clays.

It will be observed that all of the materials reach a crushing strength considerably beyond 10,000 pounds per square inch, including No. 37, which is a calcareous surface clay. A shale, No. 35, even reaches a strength of over 32,000 pounds. It is quite evident that none of the clays possess an intrinsic compressive strength of less than 15,000 pounds per square inch when burned to their best strength. On comparing these results it will be found that the real resistance to crushing action in the case of shales is superior to that of granites. These values thus establish ideal limits, which we should aim to approach as closely as is possible. The reason why the strength of bricks does not approach closer to these maximum values is to be sought in several factors, that of the shape and that of auger and die structure. From the practical builders' standpoint the effect of lamination in hard-burned brick is of comparatively little significance, but it may become a factor in soft-burned material and in clays possessing low intrinsic strength. In structures the kind of mortar used evidently is of considerable importance, a fact which has been brought out in the extensive brick pier tests conducted by the Bureau of Standards. Thus, it was found in one instance that the same bricks laid up with lime mortar gave an ultimate crushing strength of 757 pounds per square inch of brick work, but 2,917 pounds when 1:1 cement mortar was used. In another instance vitrified bricks laid in lime mortar showed 1,270 pounds, but in cement mortar, 1:3, 2,740 pounds per square inch. This behavior of the lime mortars is to be attributed to its flow under pressure, thus subjecting the bricks to more severe conditions with reference to transverse rupture. The bonding of the bricks is not of as great importance as has been assumed previously. Likewise, the effect of the sand in the mortar, unless very heavy joints are used, is not of particular significance, provided a sufficiently rich mortar is used. With reference to the crushing strength of bricks from different parts of the country, it might be stated that the average strength of building brick from the New York district has been found to be 3,943 pounds and for the Chicago region 2,156 pounds per square inch. For Ohio and western Pennsylvania the average compressive strength is very close to 5,000 pounds. For paving bricks these values are, of course, very much higher, and frequently reach 15,000 pounds.

TRANSVERSE STRENGTH.

This test is carried on by supporting the brick at the two ends and subjecting it to pressure at the middle. The brick thus is subjected to a tensile stress on the side opposite to that to which the pressure is applied and it ruptures when the tensile strength is exceeded. Since it has been shown by Howard, Griffith and Bragg that in brick walls and piers failure occurs mostly through transverse rupture, it is evident the transverse test is, after all, more useful and practical than the crushing test. This was brought out quite clearly by Mr. Bragg at our last convention. At the same time, the test is more easily carried out. It brings out variations in structure more clearly than other tests, and hence is more truly a measure of the real quality of the bricks. The modulus of rupture computed from the data obtained in the transverse test may vary for building brick anywhere between 400 and 3,000 pounds per square inch. The transverse rupture must be considered a modified tensile strength test. It is but rarely that the tensile strength of burned clay is determined directly.

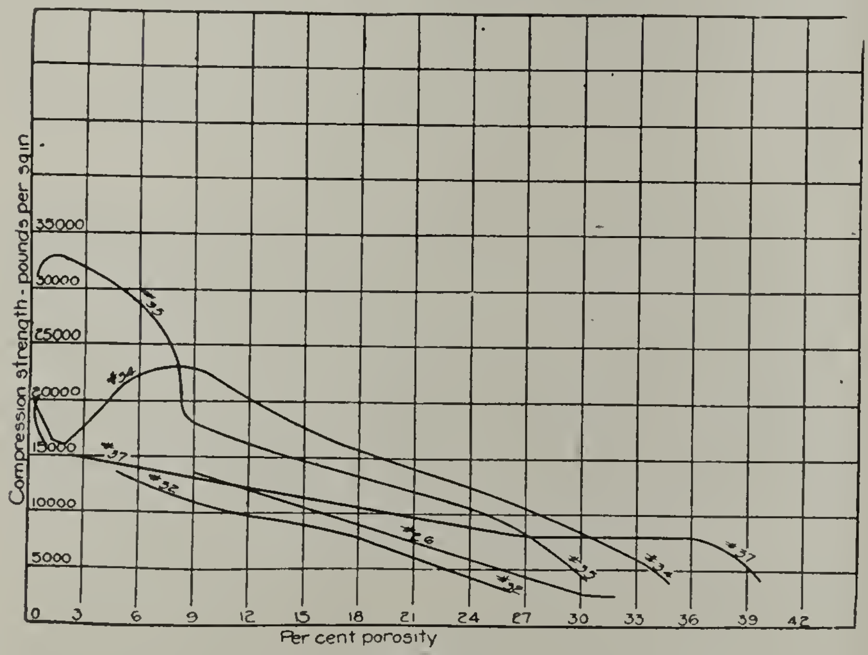


Figure 1.

POROSITY ABSORPTION AND PERMEABILITY.

By porosity we mean usually that percentage of the volume of a brick or other specimen which consists of pore space. If a brick contains, for instance, a volume of 75 cubic inches and shows a porosity of 20 per cent., its pore space or volume of air cavities would amount to 15 cubic inches. Absorption, on the other hand, simply means the weight of water absorbed, expressed in terms of the weight of the dry brick. It does not, therefore, express the volume of the pore space relative to the volume of the brick. The absorption is readily computed by dividing the weight of the dry brick into the weight of water absorbed and multiplying by 100. A brick weighing 7 pounds and absorbing 1 pound of water, thus has an absorption of 14.28 per cent. The absorption is best determined by boiling the weighed specimen in water for five hours and then allowing it to cool with the water. The weight of the saturated piece may then be determined. Other means of determining the absorption, such as the simple immersion of the brick, are to be rejected as inaccurate. The rate of absorption, i. e., the absorption of water after different intervals of time, is sometimes desired chiefly for the purpose of explaining the different behavior of bricks as regards weather resistance or durability.

By permeability is meant the property of a substance to permit the passage of air or water through it. It is usually measured by determining the amount of water under constant pressure which passes through a given area per unit thickness, say one inch, and per hour, or other unit of time. The most porous body is not always the most permeable, since the size of the pores and their intercommunication are important factors. This test is not made use of to any extent.

ABSORPTION (POROSITY) AND RESISTANCE TO WEATHERING.

In general, it may be said that the crushing strength of burned clay varies inversely as the absorption or porosity. The denser, therefore, a body is, the greater should be its strength. This generalization does not apply entirely to the resistance of the material to weathering agencies such as freezing and thawing. Undoubtedly, a perfectly impervious, glass-like body, should not only show great strength but also minimum resistance to the action of the atmospheric agencies, but this is an ideal case not to be realized. From the practical standpoint, it has been shown that high porosity does not necessarily mean poor frost resisting qualities. This is illustrated by the different behavior of soft mud and stiff mud bricks. Upon comparing bricks made from the same clay by these two processes, it will be found that those molded from the clay in the soft condition will show far greater frost resistance than those made from the clay in the stiff plastic state, in spite of the fact that the former shows a very much higher porosity and water absorption. Again, bricks made from shale, compared with bricks made from plastic clay, are found to be inferior in this respect and it is well known that a fairly high porosity shown by clay brick would not do for shale brick since the latter would succumb far more readily to the weathering agencies.

We cannot, therefore, set an invariable limiting value as regards the permissible water absorption of bricks and other clay products. One brick may possess an absorption of 18 per cent. and show good durability, while another might be inferior with 12 per cent. absorption. But still, we should have to consider the different allowable absorptions for the different grades and kinds of ware, since they are a general criterion of the strength. By using any one clay, making from it a number of bricks by the same process, burning lots of them to lower and higher temperatures, and determining their absorption and crushing strength, quite a regular relation will be found between the absorption and strength. But the difficulty comes in endeavoring to correlate the absorption, strength and weather resistance for all kinds of clay from the calcareous clay of the Chicago district to the shales of Ohio, the sandy clays of Michigan, and the No. 2 fire clays of Pennsylvania. The only way out of the difficulty is to establish different grades of bricks, based primarily on their physical strength. Still, we cannot dismiss the subject of the weather resisting quality of bricks by any arbitrary assumption and the comfortable attitude that clay products are invariably frost and weatherproof. We must continue to study this subject by means of freezing and other tests for we are compelled to realize that the ultimate weather resistance of clay products is the criterion by which they must survive or perish in the competition with other structural materials. If it can be shown that the average clay products is superior in this respect the fight is won. More and more architects and engineers are considering this subject since we are entering upon an area of permanent architecture.

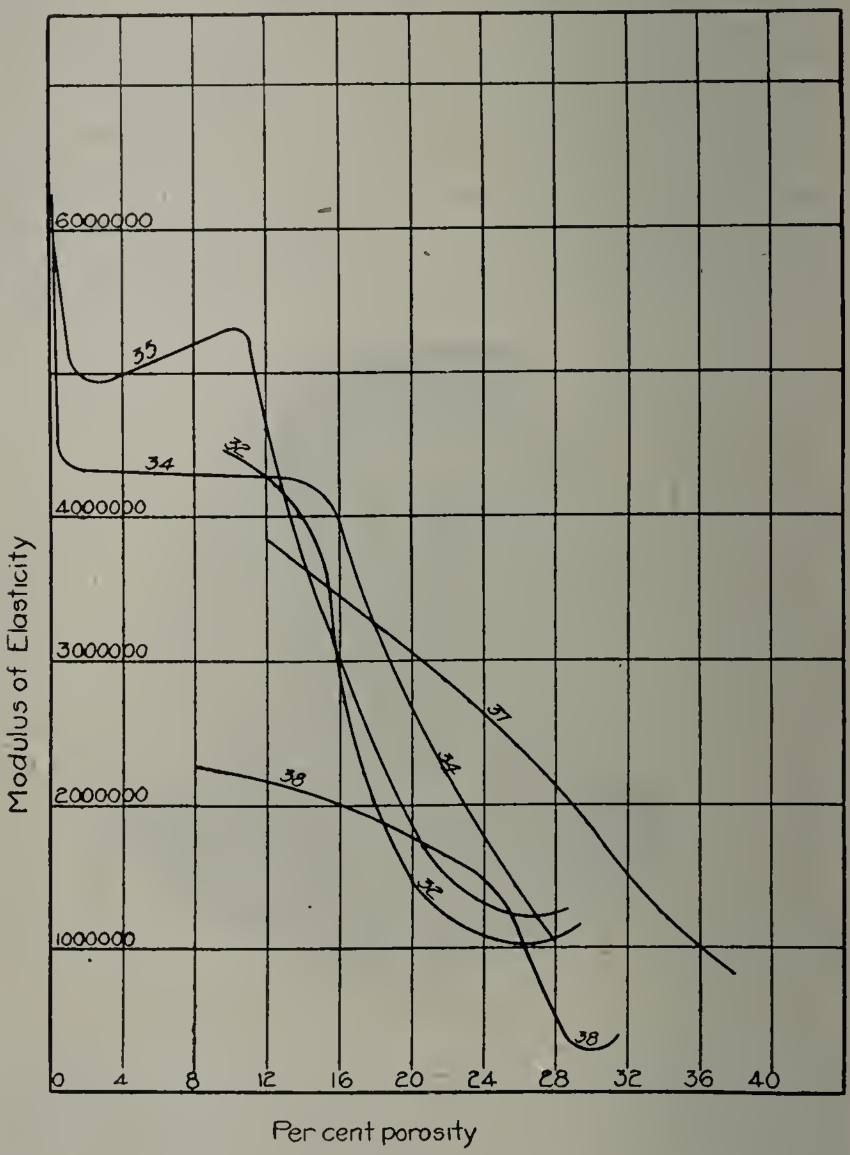


Figure 2.

The freezing test consisting in the alternate freezing and thawing of specimens saturated with water, usually repeated twenty times, is probably the best means available for determining the frost resistance of clay products. It is obviously laborious and expensive. For this reason, it was suggested several years ago by the Bureau of Standards that the so-called "Brard test" be employed, consisting in saturating the specimens in a solution of Glauber's salt (sulphate of soda) and drying them, repeating this

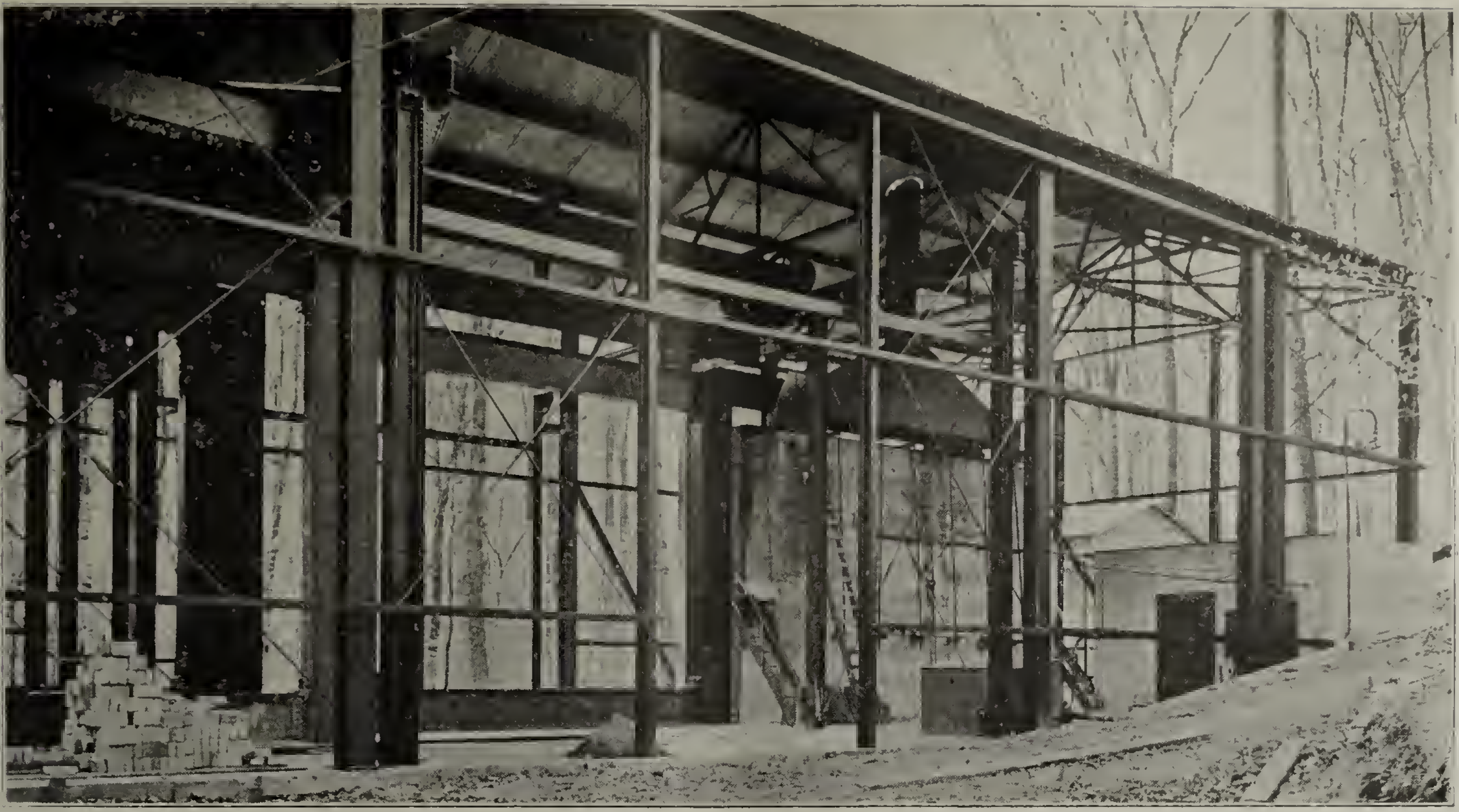


Figure 3. View of Fire Testing Equipment at the Bureau of Standards, Washington, D. C.

treatment four times. This salt, absorbed within the pores of the material crystallizes and produces an effect very much like that of freezing water. The effect is more severe than is the case for ice, and while the method undoubtedly differentiates sharply between hard burned and soft brick, it will probably be necessary to modify it in order to lessen its severity. Professor Edward Orton, of the Ohio State University, has an extensive investigation under way in this connection which has as its aim the correlation of the mechanical strength of bricks, their porosity and their resistance to the freezing and the sodium sulphate treatment. Prof. H. F. Staley, of Iowa State College, likewise has carried on considerable work with the use of the Glauber's salt, using a concentration of 15 per cent. and applying the test to drain tile.

The action of this salt we find occasionally duplicated in the case of bricks carrying a fairly high content of soluble salts. It happens sometimes, that the latter become concentrated near the

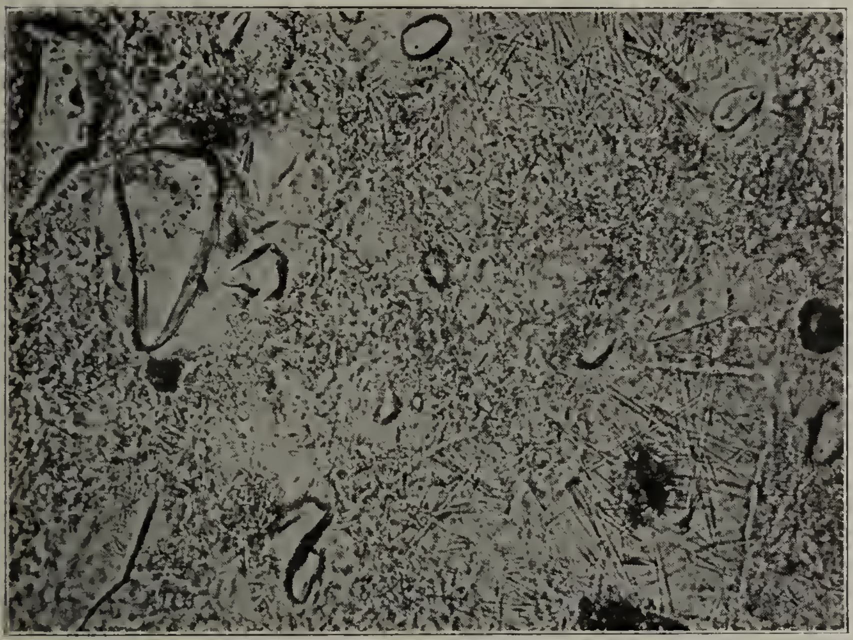


Figure 4. Micro-Section (By Klein), Showing Structure of Japanese Porcelain.

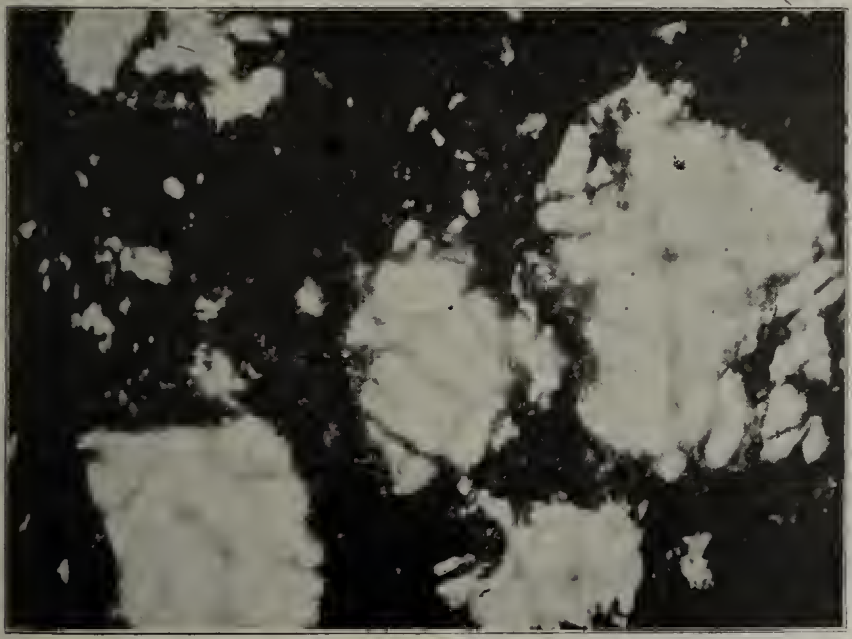


Figure 5. Micro-Section (By Klein) of Well Burned Silica Brick.

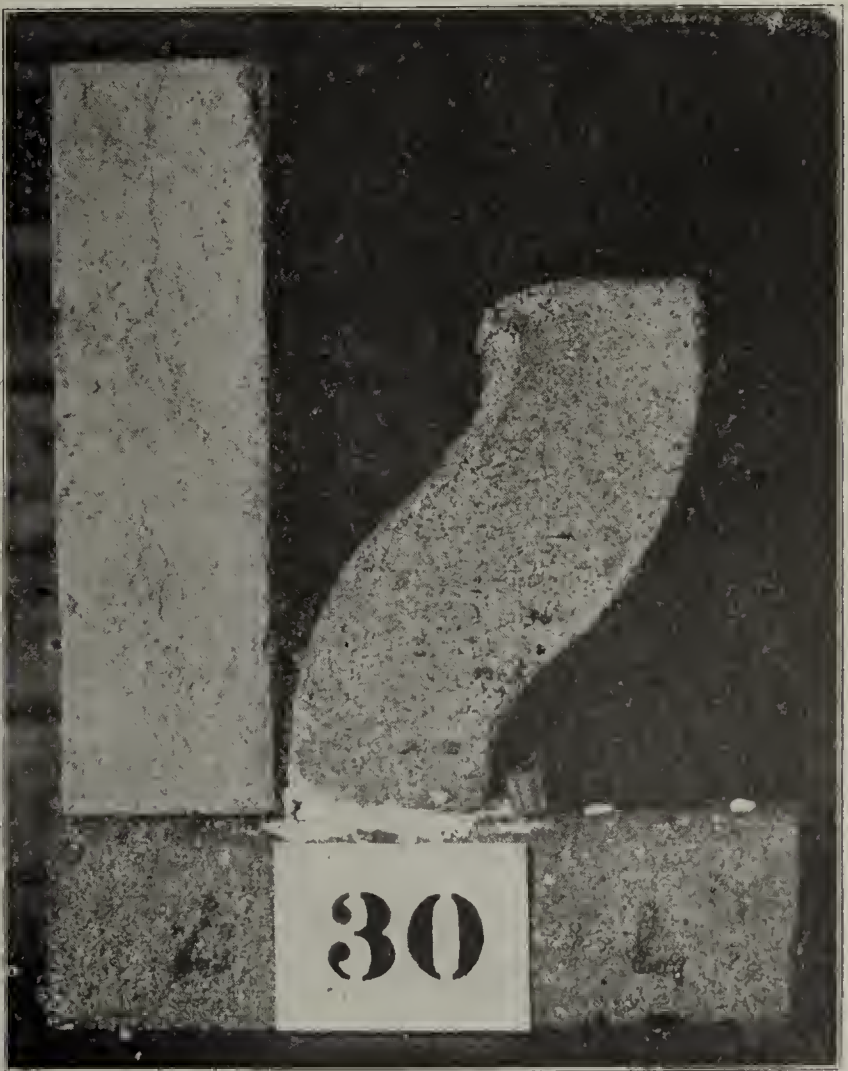


Figure 6. Failure of Fire Brick in Load Test Due to Deficiency in Refractoriness.

surface where they crystallize and cause spalling. The most striking instance of this kind observed by the writer was on one of the buildings of the University of Wisconsin, at Madison.

SPECIFICATIONS.

The work of Committee C-3 of the American Society for Testing Materials has resulted in the proposal of tentative specifications for building brick, which are given herewith:

	Transverse Modulus of Rupture		Comp. Strength lbs. per sq. in.		Absorption per cent.	
	Aver. of 5 not less than	No Single Brick less than	Aver. of 5 not less than	No Single Brick less than	Aver. of 5 not exceeding	No Single Brick exceeding
Vitrified building brick	1,200	800	5,000 or more	4,000	5	6
Hard building brick	600	400	3,500 or more	2,500	12	15
Medium building brick	450	300	2,000 or more	1,500	20	24
Soft building brick	300	200	1,000 or more	800	20	24

Attention is to be called to the fact that the crushing strength test is made on a half brick, placed on edge, and that the standing of any set of bricks is determined by that one of the three requirements in which it is lowest.

The society mentioned above is also carrying on extensive tests on hollow tile both on individual specimens and tile walls for the purpose of arriving at satisfactory specifications for tile and also of securing reliable data for incorporation in building codes.

The Hollow Building Tile Manufacturers' Association proposes the following requirements: "The tiles shall be well burned and of sufficient hardness not to absorb more than 10 per cent. of their weight of water in a 48 hour absorption test, and shall have an ultimate crushing strength of not less than 3,000 pounds per square inch of net web area tested. No tile in any wall shall be loaded, including all live and dead load so as to exceed 200 pounds per square inch of their bearing members. No hollow tile shall contain any void whose cross section dimension, measured at right angles to the web, is more than 4 inches, and the vertical webs and shells of all tiles used for all bearing walls shall have a thickness of not less than 15 per cent. of the measurements across the voids enclosed by such shells or webs."

For sewer pipe, extensive specifications are likewise being prepared by the A. S. T. M. These refer principally to allowable variations in the thickness of the shell for the several sizes and provide also several tests. The toughness of the pipe is judged by its ability to stand without injury three blows of a cast iron ball weighing 8 pounds and falling 18 inches. An external pressure must be withstood of from 900 pounds per linear foot for 6-inch pipe to 3,200 pounds per foot for 42-inch pipe. Vitrified pipe should withstand an internal hydrostatic pressure such that the direct tension in the material is about 180 pounds per square inch, or for 12-inch pipe, shell 1 inch thick, a hydrostatic pressure of 30 pounds per square inch. An absorption of 5.5 per cent. by weight of water is considered a reasonable limit.

A great deal of work has been done also by Committee C-4 of the society mentioned above with reference to specifications for drain tile, which are now practically completed, but which are too lengthy to be included in this paper.

For paving brick the well known standard rattler is now generally adopted with suggested average abrasion losses of 22, 24, and 26 per cent. for heavy, medium and light traffic streets. No other tests are required.

MODULUS OF ELASTICITY.

The modulus of elasticity may be considered as the quotient of the stress (pressure) per unit of area divided by the shortening of the specimen in unit length, say one inch, when the test is made under compression. If tension is used the deformation consists in the lengthening of the column. To illustrate, if under a load of 800 pounds per square inch the brick shortens 0.00025 inch per inch of height, the modulus is computed from the relation 800 ÷ 0.00025 and is equal to 3,200,000 pounds per square inch. The modulus of elasticity is a measure of the rigidity or stiffness of a body and hence is inversely proportional to the flexibility. For soft burned brick it is as low as 500,000, but for vitrified brick it may reach 6,000,000 or more. Good concrete on the average may be said to have an average modulus of elasticity of 2,000,000. In the case of paving bricks we have thus a decided superiority over concrete, which evidently has some bearing upon the standing up quality of brick-paved streets, especially since lean concrete is frequently below the average value given above.

The diagram of Fig. 2 gives the moduli of elasticity obtained for five clays which were burned to a number of temperatures. The relation expressed is that between the modulus and the different porosities obtained with varying degrees of burning. A modulus of 2,000,000 is exceeded by every clay when 16 per cent. porosity is reached. All but one clay does not require to be burned as hard as this to reach the same condition of strength. The determination of the modulus of elasticity is laborious and time consuming, as it involves the exact measurement of the deformation by means of micrometers at different loads.

HARDNESS AND RESISTANCE TO IMPACT AND ABRASION.

The hardness of clay products becomes an item of importance only in the case of such materials as floor tile. This property may be measured by grinding tests in which the specimen is placed in contact with a grinding wheel under constant pressure or by means of a standardized sand blast. Hardness is not directly connected with toughness and hence, as Prof. Orton has shown in his contribution to the American Ceramic Society, such tests as the application of the sand blast measure only this specific property.

Resistance to impact is estimated by the standard rattler test and for certain purposes a drop hammer test has been found useful. Thus for judging the quality of the brick used in the upper part of blast furnaces a steel ball 2½ inches in diameter and falling loosely between two guides, is allowed to drop on the specimen from different heights, which are increased until destruction takes place. The brick is placed on end on a heavy steel block.

The rattler test as now practiced, while very useful, indeed, is by no means an ideal machine, since the accidental factor is still too prominent. Further improvements would be quite desirable either along the line of eliminating the ten large spheres weighing 7½ pounds each and increasing the size of the charge of smaller spheres or the working out of a rattler on the Talbot-Jones design.

RESISTANCE TO SUDDEN TEMPERATURE CHANGES.

In the study of the fire resistance of building materials the damage done by a rapidly rising temperature as well as by sudden cooling through the application of water is being considered the most important part of such investigations. The well known tests made at the Underwriters' Laboratories, Chicago, on brick panels, are being continued by that laboratory as well as by the Bureau of Standards, in Washington. The new installation erected by this bureau for this purpose is probably the most complete of its kind. It consists of an oil-fired furnace capable of raising the temperature at practically any rate and a movable panel, suspended from an overheated track. The materials are built up in the steel panel frame in the form of a wall. The surface of the latter is heated to 1500 degrees F. in 30 minutes, after which time the panel is removed and a stream of water thrown against it, under 80 pounds pressure and through a 1½-inch nozzle. The panel is 12 by 16 feet. Enough panel frames are provided so that a number of test walls can be built at the same time. A crane is provided for moving them. The photograph of Fig. 3 illustrates this equipment.

An elaborate furnace with pressure appliance and all kinds of measuring devices is now being completed in Chicago under a co-operative arrangement between the Underwriters' Laboratories and the Bureau of Standards. This furnace is designed for studying the effect of heat upon all kinds of columns with special reference to the loads which they can carry at different temperatures. A good share of the work will consist in testing steel columns protected by clay tiles, concrete, gypsum, and other products. A smaller furnace of this kind has also been built in Pittsburgh laboratory of the Bureau of Standards for testing shorter columns.

The resistance to sudden heating and cooling is determined in the case of fire bricks by heating them to about 1000 degrees F., and plunging them in water. The number of such quenchings withstood is considered a measure of this particular quality. This test is modified in some cases by immersing only one end of each brick.

STRUCTURE AND PERMANENT VOLUME CHANGES.

The miscroscopic structure of clay products is receiving more and more attention, especially in the case of porcelain and silica brick. Since in building and paving brick the internal structure already finds expression in their physical properties, its study is more of academic interest. The microscopic study of porcelain and silica brick is of considerably practical importance, as it affords a means of determining quality and the kind of heat treatment applied. The photograph shown in Fig. 4 illustrates the appearance of a hard fire porcelain under the microscope, showing the formation of needles of sillimanite and solution of the quartz grains. The view of Fig. 5, on the other hand, gives the appearance of a microscopic section cut from a silica brick. The characteristic fracture of the quartz due to the high burning temperature is well shown and at the same time it is possible to determine quantitatively the percentage of cristobalite and tridymite formed which are a criterion of the quality of silica brick.

In the case of both clay and silica fire brick, the contraction of the former and expansion of the latter upon refiring affords a valuable means of determining quality. Thus, upon refiring to cone No. 14 a No. 1 clay fire brick should not show a contraction of more than 2 per cent. of the original length. With reference to silica brick specifications differ. The American Gas Institute requires that such a brick when reheated to 1500 degrees C. should not show a permanent expansion of more than 1 per cent. of the original length. Other clay products which are never reheated show, of course, no such changes in volume.

REFRACTORINESS.

The softening temperatures of fire bricks offer a valuable means of differentiating the several classes of fire bricks. Thus, a No. 1 clay fire brick should not soften below cone No. 31. It has been found also that by subjecting fire brick to load conditions at furnace temperatures, very much below their softening point, valuable information is obtained regarding their refractory behavior. The effect of pressure is to cause softening and consequent deformation of inferior bricks. In applying this test a good clay fire brick when subjected to a load of 40 pounds per square inch and a temperature of 2460 degrees F. should not contract more than 7 per cent. of the original length of the specimen. Fig. 6 illustrates a fire brick specimen which has failed in this test. The deformation suffered by clay fire brick in such places as the benches of gas retort installations compared with the small expansion of silica bricks has operated against clay refractories to a considerable extent and has practically lost to them the great market offered by the construction of the by-product coke ovens. As a matter of fact, it is possible to manufacture clay refractories, though their cost of manufacture is considerably higher than that of the ordinary fire brick, which show but a small contraction at high temperatures and under load conditions. In our laboratory such materials have been produced and their contraction even at a temperature of 2550 degrees F. and under a load of 40 pounds per square inch was but a fraction of one per cent. Clay refractories have the great advantage over silica materials that they are far less sensitive to sudden heating and cooling. The question of refractoriness enters also into the question of fireproofing. The writer believes that for such products no clays should be used which vitrify and become dense or soften at too low a temperature. Clays high in lime and iron oxide should never be employed in making fireproofing. The temperatures reached in many fires suffice to fuse such materials or to spall them badly and experiences of this kind tend to do great damage to the fireproofing interests.

THERMAL PROPERTIES, COEFFICIENT OF EXPANSION, HEAT CONDUCTIVITY, AND SPECIFIC HEAT.

All materials when heated expand, and this expansion is usually expressed in the form of a coefficient giving the fraction of the length which the material expands upon being heated 1 degree in temperature. The coefficient of expansion varies decidedly for different clays and also for soft burned (porous) and hard burned ware. It is the greater, the denser, and more vitrified a material is, and vice versa. The average value for the coefficient of expansion of such materials as paving brick is not known accurately. Some materials expand more than twice as much as others. As an approximate value we might take the value 0.0000049. To illustrate the use of this figure, let us compute the expansion of a stretch of brick pavement 100 feet long when heated during a hot spell to a temperature of 50 degrees F. above the normal annual temperature. We shall find the expansion to be $100\times0.0000049\times50=0.0245$ feet or 0.29 inch. If this expansion were exerted against some rigid body, it would cause a pressure of about 1,000 pounds per square inch, assuming a modulus of elasticity of 4,000,000. As Mr. J. E. Howard has shown this pressure may be considerably greater at street intersections, sometimes great enough to shatter the brick. At higher temperatures the coefficient of expansion increases. What has been said about the expansion of clay material upon heating applies also to its contraction upon cooling.

Interesting relations occur when clay products and concrete are used together as in a concrete building faced with terra cotta or a brick pavement placed in concrete, since the coefficient of expansion of concrete is very much larger than that of burned clay. In addition concrete undergoes changes in volume and hence in length under different conditions. Thus, it contracts when drying out and expands again when moistened as when the atmosphere is very humid. This may be followed by another contraction when the air is again dry. According to Considere a concrete building may contract 0.24 inch for each 100 feet of length. These changes must not be confused with the changes in length due to temperature, since they are inherent in the nature of the concrete. Such variations are entirely absent in well-burned clay products. In the case of paving bricks laid in concrete the former protect the latter to a considerable extent from rapid variations in temperature and also from moisture or too rapid drying out so that extreme stresses between the concrete and the brick are not very apt to occur. This interesting subject deserves much closer study than it has received and it is not unlikely that a powerful argument in favor of brick streets may be built up from careful observations made upon the relative linear changes of clay and concrete. That under certain conditions differential stresses between the two materials may occur cannot be denied. It could be easily shown abstractly that if bricks were to form an integral part of concrete and the latter contracted on drying out, a pressure of 1,000 pounds per square inch could be produced upon the brick. If we add to this the differential stresses due to the different coefficients of expansion, 0.0000049 for clay and 0.000011 for concrete it is quite possible to account for a considerable amount of strain or displacement. In practice, however, the use of joints and of comparatively lean concrete with a large percentage of voids make it possible to take up a great deal of this difference.

The heat conductivity of clay materials is very much less than that of metals. If we assume for the sake of comparison that silver has a conductivity of 100, vitrified clay would show a value of 0.04 so that the metal would conduct 2,500 times as much heat under the same conditions. Clays differ widely as regards this property. The more porous the structure is, the lower would be the heat conductivity. A wall built of vitrified brick for this reason conducts more heat from the interior of the house to the exterior in winter time and inversely in summer when built with porous, soft mud brick.

The specific heat of burned clay or its heat capacity, differs for the various clays according to the degree of burning. In terms of the centigrade scale, it is about 0.2 at atmospheric temperature.

MISCELLANEOUS PROPERTIES.

The electrical resistance of vitrified clay and especially of porcelain is so great that it is relied upon as the most satisfactory material for carrying high tension currents. The magnitude and importance of this use of a clay product is not realized by many. Upon being heated, porcelain as well as clay becomes much poorer non-conductors. At about 570 degrees F. the resistance is only about one-thirtieth of that at ordinary temperatures. It is quite possible, however, that improvements will be made along this line in the future.

Vitrified clay conducts sound with a velocity of about 15,000 feet per second. The pitch of the tone given out when a piece of dense clay ware is struck is related to the quality of the material. The clear sound which is heard when we strike a sewer pipe or a hard brick with a hammer is, therefore, a good criterion of its proper strength.

Hard burned clay is very resistant to such chemical agents as acids, though not quite so much so towards hot, concentrated alkaline solutions. The only acid attacking clay is hydrofluoric acid used so much in glass etching. The ordinary liquids coming in contact with vitrified clay, such as sewage, wastes from chemical plants, the water of the soil, etc., have no effect upon it. The material is, therefore, well suited for the purposes of the chemical industries.

The writer realizes the fact that the foregoing remarks are but a hasty and incomplete treatment of the subject of the properties of clay products. The topic is a large one, and would justify the writing of a large volume. If this paper has succeeded in calling your attention to the importance and extent of the subject and to the wide gaps in our information pertaining to it, I shall feel well repaid for collecting these few scattered facts. (Applause.)

General Discussion.

President Salmen: Professor Bleininger has given us a most instructive and valuable paper, and the subject is now open for discussion.

W. K. Hammond, New York City: The Professor has shown us clay products, and we have been told in scientific language what those of us who manufacture brick and clay products pretty generally know. It simply carries further conviction to our mind, but we are not making brick and clay products merely for our own edification. It is our business. We have to sell brick and clay products to the people who want them to put into buildings which may be durable. Would it not be possible, Mr. President, that this organization might have the Professor appear before various owners and architects, and show the people who are really interested in using these materials that there is no other material that is so durable and fire proof as this material which we burn at from 1600 to 2600 degrees of heat for six days and nights, and which when put into a structure cannot be destroyed, for no conflagration ever reaches such a high temperature that it can destroy brick, and when a mortar is found which will hold these brick together that is equal to the fire resistance of the brick itself, there can be no danger from fire. Can't this organization arrange that Professor Bleininger, with his splendid manner of telling the truth, get before the people with whom we are interested? (Applause.)

President Salmen: I want to mention an oversight of mine. The secretary has just called my attention to the fact that Mr. M. E. Gregory, of Corning, N. Y., was to lead in the discussion of this paper, and after Mr. Blair has spoken we will be glad to hear from Mr. Gregory.

Will P. Blair: I do not want to confine myself to the paper, but more to the suggestion which Mr. Hammond has made. I believe that after it has been carried before the American Society of Testing Materials, that this table, which fully explains the grade of brick, fully explains their quality to the producer, so that it can be released to the public, that our educational institutions will take hold of that, and these facts will be spread broadcast over the land. But until this is completed and we have the assurance that what has been done is right, there is no use to put it before the public. We have been slow about it; almost every other material in the world that is used has some measure of quality by which it can stand before the public, but we brickmakers now have that under way and I hope in the near future we will be able to give it to the public. (Applause.)

M. E. Gregory: For me to attempt to review a paper presented by Professor Bleininger would be useless. I will simply say that every manufacturer ought to study his clay and his condition and to understand these conditions. In our section of the state we have a peculiar shale; that shale, if ground too fine, becomes brittle. There is a happy medium which we have found, and certain conditions by which we can get the best results. We have also found that by the use of calcined clay or grog we can increase our crushing strength, etc. These are subjects that every brick manufacturer must know for himself in order to properly exploit his product. If a brick manufacturer does not understand his product, he should never go out on the road to sell brick. Some people think any one can sell brick. I have asked prospective salesmen, "What do you know about brick?" and they will say, "I can take a sample and sell it;" but I always say to them, "Do you know what makes a good brick, the structure of brick, strength of brick and the quality of brick?" I think we, as brick manufacturers, should study the quality of our product, be able to enlighten our customers as to the beauty and stability and lasting qualities of our product. How many real salesmen are there in the brick business? How many men in the brick business have made it a study so they can present and make the other fellow believe they have the best product on earth, and if they use it they won't have so much trouble? You can talk a fellow out of twenty-five or fifty cents a thousand just as easy as not if you have the quality and can tell why your brick are the best.

Mr. W. E. Dunwody: There is one proposition I want to put before you: Anything that tends to raise or standardize brick will help the brick business because it will make it more difficult. That may sound strange, but so long as any man with a few thousand dollars in bank and a bank of clay can go into the manufacture of brick and say to the public, "A brick is a brick," without regard to price, you are going to have overwhelming competition, because you are going to be dealing with men of mediocre ability, and the world is full of mediocrity, and when you are in an atmosphere of mediocrity you are going to have competition of undesirable sort; but when you reach a commercial atmosphere, you will have less competition, and I think, we ought to support this committee in every way. We will put our business on a higher plane through the research of this committee.

Suggestions for the Committee on Technical Investigation.

Ross C. Purdy, Worcester, Mass.: I want to make an ex parte statement here. I have attended these conventions for some seventeen years, not as a brickmaker, but I have heard these same remarks until I am dead tired. Every year you say, "We ought to," "We ought to," "We ought to"; for heaven's sake, do it. The universities say, "We want you to give us something to do." The Bureau of Standards has forced upon you the investigations explained here today. They haven't authorized me to say this, but I know these things. They asked you for samples and you haven't responded in the way you should. You have had a technical research committee for years, and they have done the best they could on $250.00 a year. Think of an organization representing one of the wealthiest industries in this country spending $250.00 a year on research work. You ought to be ashamed of yourselves! For the seventeen years I have been attending these meetings, you have been saying you ought to do something. I say the way to do it is TO DO IT! (Applause.)

President Salmen: Mr. Purdy's suggestion seems to meet with approval. I would like to have some gentleman make a motion so that we may know what we are to do.

J. H. Chambers: I want to add one word of testimony to the value of the exact knowledge that comes from such institutions as this Bureau, and also from the ceramic departments of such of our universities as have such departments. There was sent me some time ago three samples of shale from a property supposed to be exploited for brick purposes. We could have made up samples of brick from that stuff, but instead of doing that and following the old method of some years ago, I sent these samples to one of the universities, and asked what their charge would be to make an analysis of the samples. They wrote that it would cost $30.00. I told them to go ahead, and they did so, and we got a very careful report that no man connected with the clay industry could read without a conviction that it was exact. We paid our $30.00 and forwarded the report to the gentleman supposed to be exploiting this property, and there was not one of these samples that could be manufactured successfully at all. The matter was all settled at an expense of only $30.00. The university prevented that man from spending perhaps $30,000 in an attempt that would have been an absolute failure. (Applause.)

Secretary Randall: I am heartily in accord with Professor Purdy's suggestion. We have been working along, trying to get up to a point where we could do the big things as he wants them done. We made a little start last year, and it was in direct response to a request from Professor Orton, the secretary of our Committee on Technical Investigation. We raised our dues last year to the magnificent sum of $5.00 per annum, so we might have a little more money for the Technical Committee. Now, perhaps, if Professors Orton and Bleininger can come forward and say we ought to do a whole lot better than that, then we will. Our members have got to learn that they much contribute substantially to that sort of work or they will not get very far in competition with other materials that cut deep into their markets every year.

William C. Koch, St. Paul: It seems to me here and now is the time to make contributions. I am from St. Paul, and I will pledge $100 for my company. If they don't pay it, I will pay it myself, for I think this is an important matter.

President Salmen: Perhaps if Professor Orton were here we might take this matter up with more intelligence.

Secretary Randall: The trouble is the American Ceramic Society had extended its meetings over a day more than they should have done. At one time we had an agreement with them that the Ceramic Society would hold their meetings Monday, Tuesday and Wednesday forenoon, so there would be no conflict of dates; but their programs have grown so long that they cannot finish it in the two days and a half, and this year they have lapsed over into the fourth. I think it would be well to take the matter up with them. We have, heretofore, held our first sessions Wednesday afternoon, but knowing that they were going to hold over Wednesday and Thursday any way, we thought meeting here in New York, we would meet in the morning and hold but one session a day. Perhaps after this we can go back to the old agreement and hold our sessions at different times. I am exceedingly sorry Professor Orton is not here today. I know he could tell us just what the Committee on Technical Investigation is doing and what they require to continue the tests. He will be with us tomorrow, however, and give us all this information.

Lee B. Humphreys, Brookville, Pa.

Will P. Blair: I am very sure the members of this convention would like for Professor Bleininger to lay aside his modesty for a moment and tell us that the complaint that the brickmakers have not co-operated in this matter as they ought to, and make a definite statement as to the extent of that co-operation and where it was a failure and what we ought to do. I believe every man would like to hear from Professor Bleininger on this question.

Co-operation with Bureau of Standards.

Professor Bleininger: We have asked very little. All we wanted was brick. Of course, you know the National Association helped us. It is the only body of clay manufacturers that has helped us financially in carrying on the elaborate kiln tests—the most elaborate ever made in the world— and the National Brick Manufacturers' Association has helped us financially. We felt we should not be compelled to pay for a couple of thousand brick, that we should be given them free. We are not asking money for carrying on the investigations. These panels represent an outlay of perhaps $8,000, and the other work is very expensive, but it is taken care of. All we need, all we ask, is to be suppled with samples of brick, and if they can pay the freight so much the better, because under the conditions we are working, it makes it very difficult to handle brick shipments. That is all we ask for. (Applause.)

President Salmen: I understand it you want these brick delivered at the Bureau of Standards at Pittsburg.

Secretary Randall: In that connection—I don't like to handle a hammer, much less use it—but among ourselves it is pitiful the lack of interest a large number of the manufacturers have manifested in this matter. To the credit of the Greater New York Brick Company, of this city, be it said, when Professor Bleininger advised me last year that he needed some brick from the Hudson River section, I carried the information to Mr. Rose and he took the matter up with his company and they donated a carload of brick to the Bureau of Standards and paid the freight from New York to Pittsburg, so their skirts are clear on that score; and President Salmen did the same thing, sent a carload of brick from New Orleans. Now when Professor Bleininger lets you know he wants brick, don't be afraid to give them and pay the freight.

J. W. Hahn, Boston, Mass.

T. E. Wilson: As you know, I represent the Pennsylvania Clay Club of Pittsburg. If Professor Bleininger or any one else who wants brick for testing purposes will write to the secretary of the Pennsylvania Clay Club of Pittsburg, we will be glad to furnish all the brick he wants. Pittsburg is quite a brick center. We have all kinds of brick—common brick, face brick, fire brick, almost anything you want, and this club will be glad to furnish, fre of charge, any and all brick needed.

W. E. Dunwody: I do not think I know enough about the situation to discuss the financial end of it, but I move the appointment of a committee of five to investigate the other features of the matter under the direction of the Executive Committee.

M. E. Gregory: I second the motion.

Motion carried.

W. A. Howell, Toledo, Ohio: After all this information has been given and we are all convinced of the advantages and superiority of brick, we don't use the brick. How is the ultimate consumer to get in possession of these facts. I do not think we will get any further than we have unless we acquaint the ultimate consumer with the advantage of brick, as all other material concerns are doing with their materials. A year ago a movement of this kind was started. Why could not the organization started at that time take care of this investigation of brick with the committee, and also the dissemination of the knowledge gained by the investigation?

Status of the National Building Brick Bureau.

Secretary Randall: If the president will allow me, I will answer Mr. Howell's question. As secretary-manager of the Building Brick Bureau, I know, of course, what Mr. Howell refers to, because he contributed to that bureau. We have made some progress. The lack of results is due to the lack of support of the bureau. We have sent out a couple of thousand circular letters and talked personally with many members of the brickmaking craft of the country, and while they all favor the movement, all seem heartily in favor of it, there seems to be a reluctance to support the bureau financially, and insteady of raising $15,000 or $30,000, as we should have done readily, it dwindled down to a few thousand. This really brings us to the bureau work, which is dear to the hearts of your president and first vice-president. At our convention at Cleveland last year, this matter of publicity was brought up through a paper by Mr. Wreford, of Detroit, and created quite a little enthusiasm. A number of the members there pledged financial support to the bureau, but, I am sorry to say that but one or two of the parties lived to their promises. In fact, one gentleman who pledged his city for $1000 never came through with a penny, and those who held up their hands did not come through. We can take this matter up here and now if you like, and if any of you stand up and pledge support to the bureau, you are going to have your names taken and you will be dunned for the amount you pledge. If you want to take up the matter of bringing your material to the attention of the ultimate consumer, I see no reason why we should not take up the matter now. Mr. Howell was one of the contributors to the bureau and has a right to know how the work is progressing. The bureau work has not fallen through, but the whole thing has lagged because of lack of financial support. You cannot push a thing of this sort without money.

Mr. Howell: Most industries donate to a bureau of that sort for the purpose of pushing their materials. A brick manufacturer will go into an architect's office and push their brick and no other brick. If we can have an organization with a paid secretary and a paid force to look after it, a contribution of five cents a thousand by the brickmakers represented here would create a fund large enough to do all this work.

Mr. Deckman: Three-fourths of the brick men would fall dead if they were asked to pay five cents a thousand.

Mr. Howell: That is just where the brick men are at fault. That is just why they are in the condition they are in now.

Mr. Gregory: We are getting off the subject of this technical work. Let us stay with that subject until it is finished. If we get to talking on two or three subjects, we will not get anywhere.

Mr. Koch: To my mind, the two come together in this way. The ultimate aim of the Association should be to issue for the building trades of the country a hand book on brick. That is something that almost every architect is waiting for and has not got. If we can show that the technical work as done with our assistance or otherwise, is correct, and then have it published, you must have some means of doing it, and they go together.

Secretary Randall: There was a motion made and carried that settles the technical side of the work, and the president is to appoint a committee to look after that. Now, going back to the bureau. I am not going to put it on the basis of five cents a thousand, but how many men here in this room are willing to give $100 cold cash for the support of the National Building Brick Bureau. Please hold up your hands and give the number of your badge. That will give us your names. Eleven members responded.

Mr. Hammond: Are the members thoroughly familiar with this? To whom this money is to be sent when contributed, and where it is to be used and how? Sometimes we go to church. At least, we have friends who do, and there are certain days when we think it is time to go home, and some fellow gets up and begins to tell about the heathens, and it takes a lot of money to get a little bit of money to the heathens. There is no question but that $50,000 can be used for the proper purpose. Where will it be sent and where will it be used? One man says they don't want any money, but, nevertheless, they do. Mr. Blair, here, says that if it is settled that what Professor Bleininger told is all right it will be put before the public what we all know, that brick and clay products are the real thing.

Secretary Randall: Mr. Hammond still is confusing slightly the technical information and the bureau. One will dovetail into the other. The money given to the National Building Brick Bureau will be devoted to the compilation of facts and the compilation of literature for distribution among users of clay products under the direction of the officers of the bureau. The president of the bureau is Fritz Salmen, the treasurer is George H. Clippert, and I happen to be the secretary and manager. We have been studying along this line for two years. We have outlined some things which if we had the money we could do, and one of the things that we want to do is to issue a text book on the quality of brick as a building material. We raised in the course of two years a little less than $4,000. You cannot get very far with that. However, we did issue one book, beautifully illustrated, entitled "A Book of Distinctive Brick Homes," which has been out a year and has been widely distributed by contributors to the bureau. It is a high-class publication and cost quite a lot of money. I think now we should get out another publication, going into less expensive structures, say brick homes costing $3,000, which the brick men can afford to take and distribute among contractors and owners and architects in their own locality. That is one of the things the bureau has in mind. If, $100 is too much for some of the manufacturers, how many men here will give $50.00?

W. P. Blair: Why don't you try it at one cent a thousand?

Secretary Randall: A cent a thousand means a snug little sum to a man who makes 50,000,000 brick a year. I sent out over two thousand letters to the brick men of this country in which I asked them if they would contribute to the bureau, if not on the basis of one cent a thousand, on the basis of a variable membership. I mean by a variable membership, a membership of three classes; an active membership; a supporting membership, and a contributing membership, ranging from $100 to $25.00 a year, so that the smaller manufacturers, if so disposed, could afford to give $25.00 a year and help the building brick industry. The manufacturers in the several localities throughout the country want this benefit in their own vicinity. For instance, a southern manufacturer may say, "What is the use of my giving $100 to the bureau if you are going to spend it in Pittsburg, or Chicago? We want it down in Tennessee." We must meet that proposition and render service in the home market of each and every contributor. In response to that letter, how many replies do you suppose I received? I enclosed an addressed envelope—one man said it was one of the clearest and most convincinig letters he had ever read. How many replies, out of 1,800, do you suppose I got? I am ashamed to tell. We got a number of replies from men who said, "I am for the bureau." A few said they would contribute $100 a year; others said they would give $50. The intent of the letter was to determine whether a sufficient number of the clay craft are interested to justify a continuance of the bureau; to get a start that will mean larger things, more effective work in the future. If this is done, eventually we will employ technical engineers and send them to universities and deliver lectures on the value of brick as a building material. The cement people of this country are spending from $100,000 to $200,000 a year, and that is why the cement industry has been growing by leaps and bounds. How many men are there here who do not want to give $100, who will give $50?

A. R. D. Johnson, Raleigh, N. C.: I want to bring out one point. I think of one fundamental reason why there is no more response. Every man's judgment must be convinced that $1,000 or $2,000 spent in twelve months in promotion in a general way all over the United States is too little to count. A man don't want to pay $1.00 or $12.00 to be spent in twelve months all over America. I don't want to throw away a dollar myself. I would just as soon spend $500 as $1.00 if I could see the benefit to come from it. I would not give anything for what I might expect to get out of $2,500 spent in a year all over the United States, but if you wanted to spend $50,000 or $100,000, that will accomplish something; and when you do that I am willing to contribute something. I want to say in reply to the insinuation that the brick men are not willing to spend money for advertising. I think you will find that the brick men in their own localities and in their own way are doing a lot of publicity, but $1,000 or $2,000 is not going to do anything.

Back to the Matter of Technical Investigation.

Mr. Blair: I do not think Mr. Hammond's question was fully answered, and I think this body ought to understand something that has not been brought out. I had hoped that Professor Bleininger would bring out a little of the details when showing those photographs, and show that the demand for a standard quality or measurement of brick did not come from the brick people of this country at all. The steel people, the concrete men and other material men, forced their materials upon the public of this country, and they went to the American Society for Testing Materials and demanded that that society do something in order that they would have something that would enable them to speak of quality. The demand that the American Society for Testing Materials take up the question of testing brick for quality did not come from the makers of brick, but from the users of our material. In response to that demand the Committee on Structural Materials in the American Society for Testing Materials, through the Bureau of Standards under Professor Bleininger, undertook this work and furnished a report in the name of that society which would be received with favor and confidence and be adopted by the building public. Professor Bleininger sent out over this whole country, not only here and there, for brick. He wanted a few barrels of brick from the different sections of the country. Since Professor Bleininger did not say it, I don't know that I should, yet I know that just a few barrels of brick were given him, and it has delayed this work because they could not get the brick they wanted, regardless of this money. I know there are many liberal brickmakers in this country who, like the gentleman who spoke a while ago, would be willing to pay into a big fund that would be commensurate with the demand and the industry so that all the people everywhere might know of the advantages of brick and the superiority of brick as a building material, but there are other manufacturers who do not seem to see beyond their own interests. The question is whether we have the courage of our convictions as brickmakers. Why the cement people would have turned up the can and poured out $25,000 in less time than we have been talking about it.

Wm. Burgess, Toronto, Ontario, Canada.

W. H. Taylor, New York: It seems to me that you have two matters confused. The question, as I understand it, was through the paper that was presented by Professor Bleininger which brought out the thought that this body of men were not furnishing that which was necessary to have in order to prove the quality of common brick or building brick. I failed to understand from what I have heard today that this organization is in possession of the necessary data to adopt the plan for which you have been asked to contribute. As I understand it, the first question is, is this body of men, or are the brickmakers of this country willing to stand back of the men who are making possible the acquisition of information needed to put into form and print information for the public. I think you are getting the cart before the horse. We have not the information except as my friend, Mr. Hammond, has said, we know it ourselves. It is quite possible some of you do know your own plants and your own clays, but is it not a fact that these other laboratory investigations, the work that is going over there is not simply for you and me, but it is to show the public at large, the very ones whom we wish to educate, that the average product of our plants so far excels the average product of any other line of materials that we want them to use our material? That being the case, I have not stood to say we would pay because I do not think you are going about it right. You will pardon me, for I am probably one of the youngest members of the Association so far as life of membership is concerned, but I think we are here to talk frankly, as we do. I think the best you can do is to go back to your original proposition that was brought out first, and that is what will you do in the way of financial support for distinctly laboratory work for the purpose of gaining information to be subsequently supplied in pamphlet or any other printed form, to be circulated in the form of lectures and addresses to universities, to public meetings, builders and all other avenues of distribution, and I respectfully ask that this body now vote upon that proposition as to whether they will contribute towards the laboratory work with the distinct understanding that it will be done along the lines to obtain specific information pertaining to the articles produced by the members of this Association, and to that end and simply for the purpose of getting it before you, if I am in order, Mr. Chairman—I may not be, there may be another question before the house—but if I am in order, I move you, sir, that the members of this Association pledge, as an association, and to the extent that it is necessary submit each one to an assessment in proportion to their output, a sum that may be agreed upon here as a fair sum for the purpose of laboratory work alone, and that the results of that laboratory work be determined at as early a date as possible; and that after that is determined that the members of the Association be notified through our secretary, or the proper channels, that the result needed to intelligently place before the public what we have to offer is ready and that we then be asked for our contribution for directly publicity work.

A. R. D. Johnson, Raleigh, N. C.

I undertake to say the response will not be twelve, but you will have a liberal response, as the gentleman from the South says, when we know what we are going to get out of it, not individually—I do not take it he meant that—but what the industry will get out of it. I think, Mr. Secretary, when you go at it in this way you will find the brick men just as willing and as liberal as the cement men.

William K. Hammond: As my friend, Mr. Taylor, has said, I don't want to seem to force myself into your discussions without making it worth your while. What you are making your brick for is to sell them. We cannot sell them unless we find customers. The customer won't buy unless he has a place to put the brick. The proposition is all right. I see gentlemen sitting in this room that I have known all my life, and they will know I am right when I say that fourteen years ago it was easy to sell in this market, twelve or fourteen hundred million brick a year. There is not a man on earth today who can sell 75,000,000 brick in this city—in Greater New York—and yet the development of building has increased. It is not because of the lack of quality, but something that has not been touched upon here. As Mr. Dunwody said, somebody might drop a spike in the pinions. Well, somebody has dropped a spike into our pinions. It is the man who lays our brick, the bricklayer and the hod carrier. My life has been threatened many times in going through strikes; it is fight, and fight, and fight, until today the unions have the United States Government by the throat. Are we going to stand by and do nothing? All these things have to be taken into consideration. Your brick are not being used; another material has come in that may be used without connection with such a strong union. How can you adjust that matter? You may not all be familiar with the fact, but it grinds us in New York City. If it grinds you the same in your own individual towns, you are to be regarded with pity.

Secretary Randall: Again I want to ask you to discriminate a little. For the benefit of Mr. Hammond and Mr. Taylor, I want to say we have a Technical Investigation Committee, and it is comprised of very able men. Professor Bleininger has been on that committee for a number of years, and Professor Orton is also on that committee, so you know you are in safe hands. So, Mr. Taylor, and Mr. Hammond, and Mr. Purdy, too, you can work through this committee; give them the money and they will do the work for you to the queen's taste. Now this is a matter separate and distinct from the other work. Mr. Dunwody's motion was that a committee be appointed to look into this technical investigation and that is all settled. This is important and I am glad it has been brought out. Mr. Johnson and Mr. Taylor, who want to contribute in a big way, can do so. You have your instruments to work with in that technical committee, and could not select a more competent committee out of our entire membership. The committee has done a lot of good work.

A. R. D. Johnson: You seem to have misunderstood me. I was referring to the publicity campaign, and I think there is information about brick available amply sufficient to successfully carry on the propaganda of exploiting brick as a superior building material without having to wait for any laboratory tests. What I had in mind in saying what I did about contributions was, what the industry as a whole might get out of an investment of a small sum. Twenty-five hundred dollars would not be much more than $50 a state, and if we are not going to raise any more than $5,000 I think we had better not raise any.

Secretary Randall: If we take that position we will never get anywhere. You have to make a start.

Charles J. Deckman: I rise to a point of order. My point of order is, there is no motion before the house, nor any resolution before this body for action or discussion, and this discussion is simply at the behest of your Association or the chair.

President Salmen: It seems that this body did choose to take up this question, and while there is no motion on this publicity campaign business, and we have finished or voted on the first motion before the house and voted for the appointment of a committee to assist in the investigation of testing our materials. We then went into this publicity matter, which seems to have been with the consent of the assembly, so I do not see that we are very far wrong or out of order in discussing this question, which is of great interest to the Association as a whole.

Secretary Randall: President Salmen is right. When I was a boy they were wearing boots a great deal, and it was a common expression that you could not lift yourself with the straps of your boots. Organized effort does not grow over night. You cannot lift yourself into a fund of $50,000 in any one year. We must start in a small way. Like the great oak that springs from the acorn in the forest, the growth of the bureau has been slow, but so was that of the mighty oak.

George H. Clippert, Detroit, Mich.: Just a word. As an officer of the National Brick Bureau, I hope we will not get away from this question until we either kill the movement or let it live. I think it is a good opportunity right now. It may be out of order, but I think it is one of the most important questions before this convention. The secretary called a meeting a few nights ago of the contributors of this bureau, and we had two or three, and that has been the way ever since this bureau was organized. I am one of the officers, and I insist that we either make it or break it right now.

Elisha K. Kane: What is the question before the house?

President Salmen: I thought I had just stated what was before the house. We are trying to get somewhere with this publicity matter.

Mr. Taylor: I would like to ask the secretary if the Association now has in its possession, at this time, sufficient technical information such as has been thrown on the screen today and in addition to it, necessary to make your propaganda?

Secretary Randall: We have a great deal of information which has been completed by the Technical Investigation Committee, which is subject to the pleasure of the Association. We have perhaps a half dozen different leaflets on that subject which we will be glad to furnish to you, which the Technical Investigation Committee has furnished to this Association. Last year the report was omitted from our general report because Professor Orton did not complete his copy, but that report will be furnished in leaflet form and, besides that, they are now at work on a report of their investigations for the present year.

Mr. Taylor: The beautiful booklet I received sometime since on brick homes did not have anything to say as to any particular reason why I should use brick. It did not tell me anything that would induce me to use brick. Whenever I want a pretty building, or I want something real attractive, I go to some architect that I think has the ability to make me a nice picture, and with the brains to combine the various things to bring out that picture into actual building. That is not what I understand this body wants. I would not give one penny toward the distribution of such literature at this time, but the kind of literature that we are after will produce results. Mr. Hammond has hit the nail on the head when he told you what was sold in this market fifteen years ago and what is sold in a very much enlarged territory today, and then he got off the subject altogether by talking about unions, which has nothing to do with the case. The fact of the matter is that the propaganda that has been put out by people manufacturing other kinds of building material has been to show the advantages of using these other building materials, and we haven't had brains enough to do anything of that sort. But it is possible for us to have the same thing, if we have this fund that we can contribute a small sum of money toward this laboratory business. It will probably keep us abreast of the times, and I would be heartily in favor of contributing toward a fund of this character. First, have we the facts that will warrant publicity at this time? If not, then I say, contribute toward this laboratory tests first. Let us have these facts first, and then go after the other.

President Salmen: The chair wishes to make an explanation. I have been so interested in this discussion on the bureau question that I overlooked the fact that there was a motion before the house, or at least a motion was made, but it has not been seconded. A gentleman rose to second the motion, but someone else got ahead of him, and I believe he should be given an opportunity to second this motion of Mr. Taylor's now, if he so desires.

Will P. Blair: I rise to a point of order.

President Salmen: State your point, Mr. Blair.

Mr. Blair: My point of order is this: that the motion made by Mr. Taylor is out of order, because it deals with a subject already dealt with, and upon which action has already been taken. If that is not satisfactory to this body, the only way to get at that is simply to make a motion to reconsider that question and then we are at liberty to take the subject up in some other form, but until that is done the gentleman's motion is out of order entirely.

Mr. Purdy: The motion that Mr. Taylor made was that this convention express its hearty approval of obtaining facts before publishing. I second Mr. Taylor's motion now, and have tried to second it half a dozen times.

Secretary Randall: Mr. Purdy has not given Mr. Taylor's motion as I am sure most every one understood it.

Mr. Deckman: I move the previous question.

Mr. Kane: Before seconding the motion of the previous question, I wish to state that the motion as stated by the seconder is totally different from the original motion. Hence Mr. Purdy is not seconding the same motion. The original motion, as we understood it, was to pledge ourselves to raise a sum for this technical work, including the gaining of facts for publication. We rather understood the seconder of the motion that we simply express our approval of the Committee on Technical Investigation and its work. If I be right, there has been no second to Mr. Taylor's motion, the second having been for a different motion altogether, which has not been made.

Mr. Taylor: I would ask that the stenographer read my motion.

President Salmen: We will hear Mr. Taylor's motion.

(The original motion was then read, sustaining Mr. Kane's statement.)

President Salmen: It would seem that Mr. Kane is right.

Mr. Purdy: I second Mr. Taylor's original motion, pure and simple.

Mr. Kane: I second the motion for the previous question. Carried.

President Salmen: I take it there is no further discussion of Mr. Taylor's question. There seems to be so much confusion I will ask you to rise. Those in favor of the motion will rise. The secretary will please count.

Secretary Randall: Twenty-two have stood, Mr. President.

President Salmen: Those opposed please rise. The motion carried, 22 to 18.

Mr. Mayer: I rise to a point of order, Mr. President. Not half of the members voted. I don't think they know what they are voting for, any way. (Laughter.)

Mr. Taylor: I would like to make a suggestion and that is that a committee be appointed while we are here to confer with the secretary or the committee having this matter in charge, and have prepared a report for tomorrow morning's session as to the amount of money necessary or that would be advisable to set aside for investigation purposes.

President Salmen: Vice President Robb, will you take my place for awhile?

Mr. Kane: Mr. President, I move that a committee of three be appointed to raise from the membership of this Association financial aid for the Committee on Technical Investigation. And on that motion I wish to speak, if, perhaps, I can get someone to second it.

Warren Griffiss, Baltimore: I second the motion.

Mr. Kane: This is what I want to say: These gentlemen who compose this committee on technical research are scientific men; they are not bankers. They are not selected on account of their ability to drum up money. Their work, one of the most commendable for which this Association has labored, is now reported to be pinched for lack of funds. We have passed a resolution assessing our membership for any amount that the committee may decide upon, and this committee that we now propose can act in accordance with that committee and can obtain money that the Committee on Technical Investigation cannot raise.

Mr. Taylor: I move an amendment to that motion. In the first place, it is out of order. The object is to pledge ourselves to an amount. There is no committee to go around among this Association. You voted on that here today, therefore, this motion is out of order. In the next place, if I am correct, Mr. Chairman——

Chairman Robb: I am a little at a disadvantage taking the chair right in the middle of this discussion.

Mr. Blair: I will set you straight. We first passed a motion, made by Mr. Dunwody, referring to a committee to take charge of this subject. Then we passed another motion, saying that we would stand an assessment for the purpose for which this committee was appointed. Now, in order to straighten out this dilemma, I believe I can make a motion, if Mr. Kane will withdraw his motion.

Mr. Kane: I withdraw my motion with the consent of the gentleman who seconded it.

Mr. Blair: I move that the committee which is to be appointed on this subject shall be directed to advise this Association as the first order of business tomorrow morning, as to how much that assessment shall be.

Mr. Taylor: I second the motion.

The motion was put by Chairman Robb and carried.

Chairman Robb: What is the next order of business, Mr. Secretary?

Secretary Randall: If it is the pleasure of the convention, I think we can go on with the program. First, however, the chairman of the Ladies' Committee, Mr. Pettit, asks me to announce that on account of the weather, the ride for the ladies has been postponed until tomorrow morning. The next order of business is Number 5 on the program, "Mining Clays," by J. H. Squiers, Agronomist, of Wilmington, Del. Mr. Squiers is unable to be present, but he has sent a very able representative in Mr. J. B. Stoneking, who will give us an illustrated talk on "Mining Clays."

J. B. Stoneking, Wilmington, Del.: Mr. Squiers being unable to be present, I have to take his place on short notice. It reminds me of a story told on the State Fish Warden. It seems that in certain sections of his state, some fishermen were using a little dynamite and dynamiting the fish holes. He was pretty sure what was going on, but he did not have any evidence. Finally, he went down to a little town and went around among the men for awhile, and finally got an invitation to go fishing with one of the boys. When they got out a piece, the fisherman, who was Irish, made up a dynamite cartridge and, handing it to the warden, said, "You hold it while I light it." He lighted it, and then said to the warden, "Now you can do as you please with it; either hold it or throw it in." (Laughter.) That is the predicament I am in today.

MINING CLAYS.

J. B. STONEKING, M. E., WILMINGTON, DELA.

Mr. President and Gentlemen of the Convention:

The subject of mining clays for industrial purposes is a very broad one and has many ramifications varying from methods applicable in ordinary brick clay through fire clays, shales, and the finer clays used in chinaware and the ceramic industries, hence only a few salient features can be given here. Each pit has its own particular peculiarities of material and a method which is eminently suitable for one condition may be absolutely wrong for another. Hence, it is necessary for every owner and manufacturer to study closely his own mining problem and adopt the method giving the greatest efficiency and least cost.

J. H. Squiers, Wilmington, Del.

In general there are two systems of mining, the open pit and the underground. Each has its adaptations for certain conditions, but by far the most of our clays are mined from open pits, both because the present worked clay deposits are at a comparatively shallow depth and it is much the cheaper method, allowing the handling of large quantities of material by labor-saving equipment and modern machinery.

Open pit clay mining consists of the stripping of the surface layer of soil called overburden which always contains humus, roots, and other foreign matter detrimental to the clay, and the excavation of the desired clay by any practical means.

The underground method is applied to deep lying strata where the amount of overburden is too much and too expensive to remove. The mining is carried on much the same as coal mining by the pillar and room method. Soft plastic clays cannot usually be satisfactorily mined by this method as the expense of timbering to hold up the roof is more than the returns will justify.

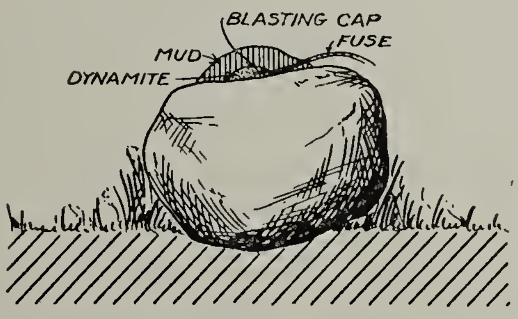
With the constantly increasing cost of labor and the present abnormal shortage, the cost of mining clays has risen to such a point as to force many operators to temporarily suspend work or to change from the old slow hand digging and loading methods to a more rational use of labor-saving devices such as modern machinery and explosives. There is an economic limit to the adoption of heavy expensive equipment which is largely dependent upon the desired output of the pit.

Machinery and tools of various sizes have their range of adaptability but are most efficient when operating at the capacity of the machine. For this reason, it would be folly to purchase a large steam shovel for a small clay pit turning out only a few thousand brick a year and equally unsound business economics to endeavor to supply material for several million bricks by all hand labor in a large pit. The size of equipment must be governed by the size of the business, but there is a very decided reluctance on the part of some brick men to install digging machinery and more advanced methods on account of the seemingly high first cost, even when it is apparent that the saving in operating costs over a short period of time will more than pay for the expense.

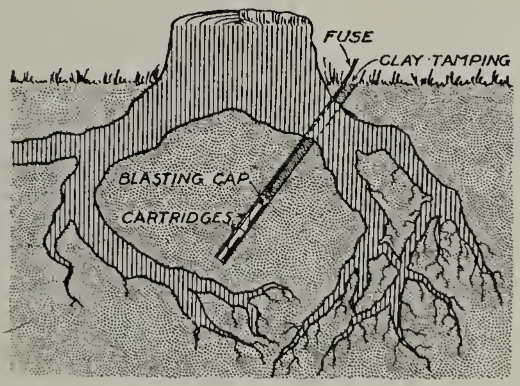
Steam shovels of different sizes are much used in the larger clay pits both where the entire face is left vertical and where it is carried in benches. Dragline excavators and orange peel or clam shell rigs are frequently used where the bottom of the pit is too soft to sustain the weight of machinery thus necessitating that the material be worked from above. In a number of small pits hand digging and loading are used although it is quite expensive per cubic yard handled.

The means of transporting the clay from the pit to the pug or grinder vary all the way from hand loading in wheelbarrows to steam shovel loading into contractors railroad dump cars pulled by small engines.

Much of the expense in hand digging and in steam shovel work in the harder material can be saved by using explosives to loosen the clay or shale so that it can be easily handled. Generally the clay is more finely broken up and better mixed where blasting is practiced thus saving work in later mixing and grinding and assisting in turning out a more uniform product. There are a variety of explosives manufactured and having adaptations for particular conditions, hence, each user can select the one giving the best results and greatest efficiency in his own work.



Correctly Placed Mudcap.



Proper Location of Charge for Blasting Small Stumps.

Explosives fall under two broad classes, deflagrating and detonating. Deflagrating explosives are those that require a spark, flame or heat to convert them from solids to gases. Of this class, the well known black powder is the principal example. Detonating explosives are those which require a shock or concussion to generate a gas from the solid. Dynamite is a detonating explosive having a more rapid action than the deflagrating explosives.

Black powder is a bulky, slow acting, heaving explosive well adapted for some work in dry clay pits.

The so-called "Low Powders" are bulky detonating explosives slightly quicker in action and stronger than black powder.

Low freezing ammonia dynamites in strengths from 20 per cent. to 60 per cent. are for heavier work than either of the aforementioned and are much used in clay and shale pits of all kinds.

There are certain supplies and accessories necessary to the firing of blasts. Deflagrating explosives in clay work are generally fired by means of safety fuse, electric squibs, or in larger charges by a primer of dynamite, while high explosives are detonated by a blasting cap and fuse, or electric blasting caps.

Fuse consists of a small powder train protected and enclosed by a covering of tape or twine. It burns at the rate of about 2 feet per minute. In electric squibs a small quantity of powder is enclosed in a protective covering along with fine wires which are heated by the electric current.

Blasting caps are small copper shells containing fulminate of mercury which is exploded by a spark from a fuse, while electric blasting caps are exploded by the heating of a small wire by a current.

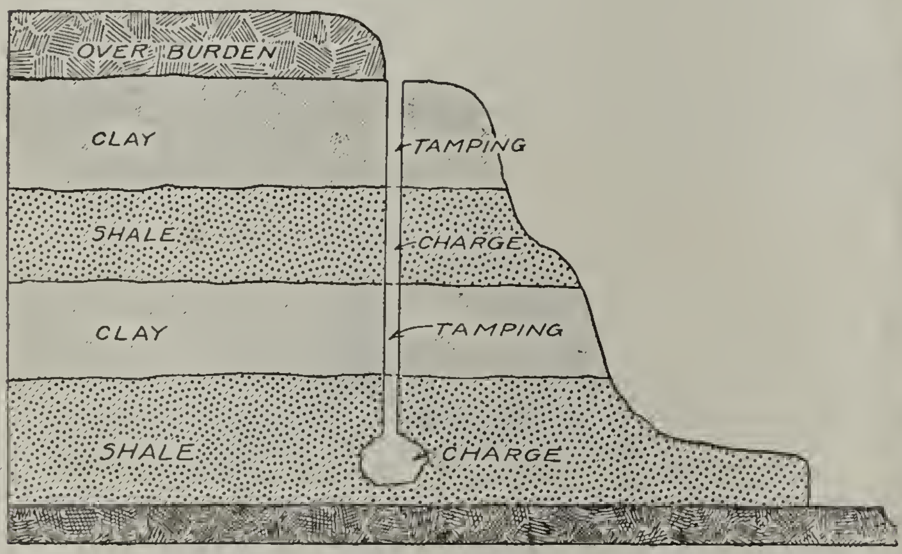
Electric supplies require a blasting machine or a power circuit to fire them. They have the advantage of being safer to use and a number of charges in separate bore holes can be fired at the same instant, thus having one charge aid the other.

All explosives should be well tamped in the hole with damp clay or similar material in order to confine the expanding gases and secure their full effect in useful work.

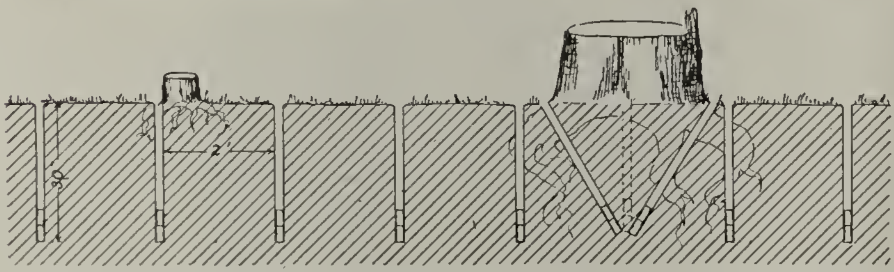
In some cases, in loading bulky explosives in small bore holes or where the charge is desired concentrated at the bottom of the hole, "springing" or "chambering" is done. This consists in exploding a small amount of dynamite in the bottom of the hole without any tamping, and makes a cavity or chamber to receive the charge of bulky explosive. Care should be taken not to load the hole until it has had time to cool off after the "springing" shot.

Bore holes to receive the explosives can be made by means of punch bars, soil or coal augers, hand churn drills, or for large deep holes well drill rigs. They are usually made flat, or nearly so, running at a slight angle downward under the toe of the face, or vertical from the top of the bank or face and extending to a depth slightly below the floor of the pit to prevent blowing out at the bottom. Flat holes are seldom made over 15 to 18 feet deep and are spaced apart usually a distance equal to from two-thirds to three-fourths of the depth. Vertical holes are preferable as they are easier to drill, and may be the full depth of the face or in benching work, the depth of the bench. They are generally spaced from the face and a distance apart equal to from one-third to three-fourths of the depth, depending upon the nature of the material.

In underground work, the holes are much shallower, generally not over 6 feet in depth. In a layer not over 6 feet in thickness, there are usually three holes in a "round" in the face or breast of the room. One of these is placed near the center on a slant and the other two near the sides. The center or "cut" hole is fired first and the two "rib" holes afterwards. In higher rooms and wider faces it requires a greater number of holes in a "round." Pillars of sufficient size should be left often enough to prevent any caving of the roof.



Cross-Section of a "Spring" Hole for Blasting in Clay and Shale.



Section Along Center Line of Ditch, Showing Loading for Propagated Blast.

The overburden or waste material in open pit work is a source of much worry and expense where deep stripping must be done in order to uncover the clay. This is frequently cleaned off ahead of the face of the pit and hauled away; again it is worked down into the pit separately from the clay and thrown back into the waste spoil pile out of the way; another way is to construct chutes, work the overburden into them and catch it in wagons or cars. Explosives are of considerable benefit in stripping operations, both in loosening material and where the same is to be thrown into chutes or back into the waste pile a little heavier loading of explosive in the borehole will aid in throwing the material and save later labor.

Stumps and boulders are obstructions to stripping and cause trouble. They can be removed and broken very easily and quickly by using some of the low freezing ammonia dynamites. Tap rooted stumps are best removed by boring a slanting hole, starting into the root about a foot below the surface of the ground, and almost through it. The dynamite is loaded into the root. Small fibrous or lateral spreading rooted stumps are blasted out by boring a hole starting at one side of and extending well under the center of the stump. The charge of dynamite should be located about a foot under the center. When large lateral rooted stumps are encountered the use of several distributed charges is best. One of these should be under the center of the stump and one under each of the larger spreading roots. They should be fired all together by the use of electric blasting caps and blasting machine.

Boulders may be broken up effectively by any one of three methods. Blockholing requires that a bore hole be drilled into the boulder approximately half way through to receive the dynamite. This takes the most labor and the least explosive. Snakeholing is done by driving a hole under and immediately against the boulder. This requires less labor but more explosive than blockholing. Mud capping takes the most explosive but the least labor. The dynamite is packed in the shape of a small mound on a vulnerable spot on the boulder and covered by a thick heavy mound of mud.

Well Drill Making Blast Holes in Hard Shale Pit.

Steam Shovel at Work in Large Shale Pit.

A Blasted Drainage Ditch in a Clay Pit.

In most clay pits, the drainage problem is a serious one and should be given thorough consideration. Where a stratum of hard pan, close tight clay, or other impervious material holds up the water and prevents the percolation downward into an underlying stratum of pervious sand or gravel, good results are obtained by shattering the layer of hard pan by charges of dynamite located in it. If the impervious stratum is of plastic material, a hole similar to a deep pole or post hole can be blasted through it by distributing the dynamite along the bore hole. The blasted hole should then be filled with loose gravel, boulder fragments or other rubbish to keep it open and furnish a drainage channel for the water.

For conditions where vertical drainage is not feasible, it is frequently necessary to install pumps for raising the water out of the pit, and constructing ditches to lead the water to the pump. Such ditches are easily and economically dug by sinking vertical holes along the center line of the proposed ditch and exploding the dynamite charges simultaneously. This makes a V shaped ditch and has the advantage for this kind of drainage that there are no high spoil banks along the sides which prevent the entrance of the water, for the sand, muck and clay are lifted high into the air and scattered over a considerable area. In using the low freezing ammonia dynamites it is necessary to use an electric blasting cap in each hole and fire with a blasting machine to secure simultaneous detonation. In warm weather and water-saturated material a high freezing 50 or 60 per cent. straight nitro-glycerine dynamite can be used. This dynamite is very sensitive and does not require an electric blasting cap in each hole, as the shock from one charge will explode each succeeding charge almost simultaneously, provided the holes are not farther than 24 inches apart. A few trial shots of 10 feet of ditch with varying depth, spacing apart of holes, and amount of dynamite enables one to arrive at a loading which will give the desired results for any particular conditions. (Applause.)

The following lantern slides will illustrate some of the ideas which I have been endeavoring to express:

General Discussion.

President Robb: I believe Mr. William Sankey, of Pittsburg, is to discuss this paper.

Secretary Randall: Mr. Sankey was here this morning, but evidently when the discussion became so prolonged he thought we would not reach this paper and has gone out.

C. A. Miller, Toronto, Ont.: I think this a very interesting talk and it is too bad there were not more present to hear it. I move we adjourn until tomorrow morning.

William K. Hammond and Two Sons; Yard in the Background.

President Robb: I prefer to leave the appointment of that committee of five on technical investigation question to our president. That committee is to report in the morning and it is quite likely that President Salmen has decided in his own mind just who he is going to appoint.

Warren Griffiss: I think it a good idea to leave the appointment of the committee with President Salmen with instruction that they are to report the first thing in the morning. I second the motion to adjourn.

THIRD SESSION.

Friday Morning, March 9, 1917—10:00 O'clock.

President Salmen: Gentlemen, the convention will come to order. The secretary will announce the first order of business this morning.

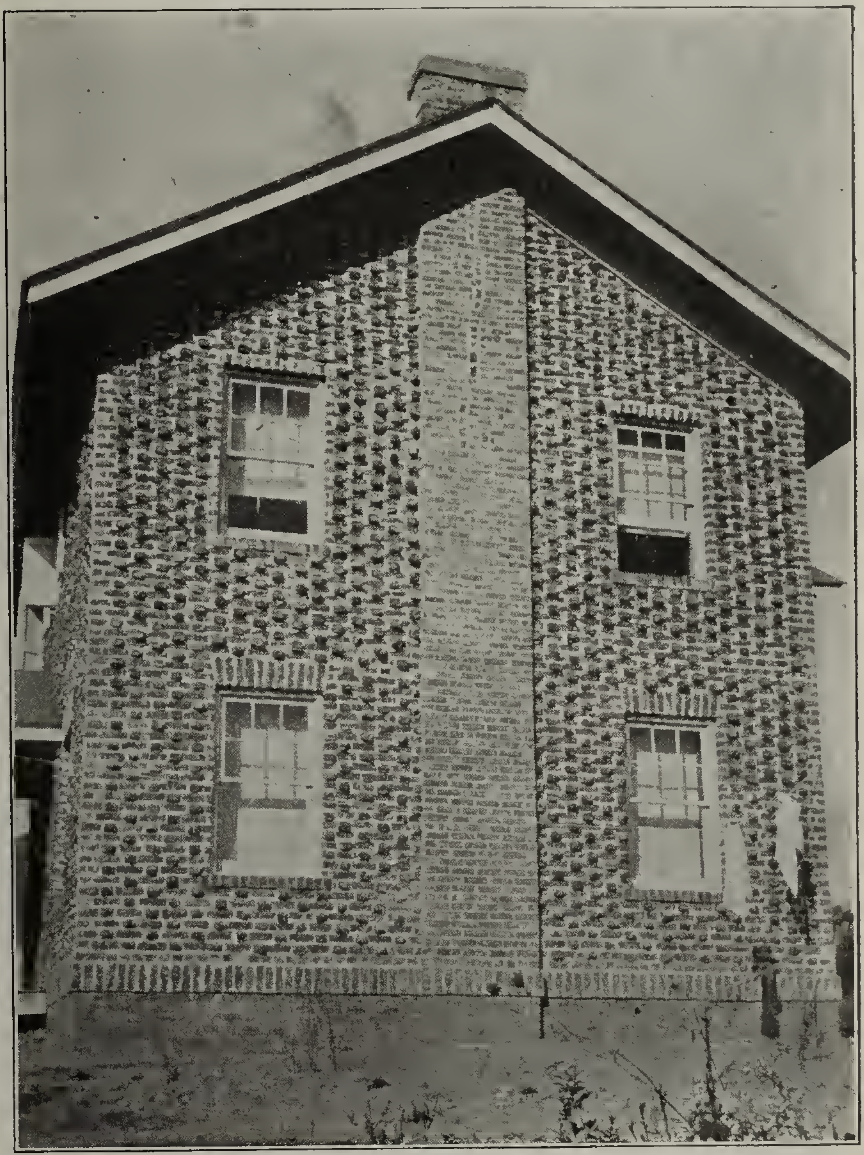
Secretary Randall: The first in order this morning is the report of that special committee, which the president appointed yesterday afternoon, consisting of W. H. Taylor, M. E. Gregory, Warren Griffiss, R. G. Eisenhart and Will P. Blair. They will be here in a short time and can report at any time. The first in order, then, taking up the program where we left off yesterday, is "Brickmaking on the Hudson River," to be illustrated by lantern slides, by W. K. Hammond.

At this season of the year, we thought it would be practically impossible to make trips to the brick plants, and so we have brought the plants to you. We are now taking a trip up the Hudson river, and I will ask Mr. Hammond to tell us about these pictures.

As a prelude to Mr. Hammond's discourse, I will show you a view of the entrance to his city office and some views of the river front where the barges of brick are unloaded and the brick carted to the various jobs. The first of the brickyard views is a picture of Mr. Hammond and his two sons in their automobile at their plant near Dutchess Junction—a glimpse of the plant being seen in the background. I am pleased to give way to Mr. Hammond who will address you on the subject

Brickmaking on the Hudson.

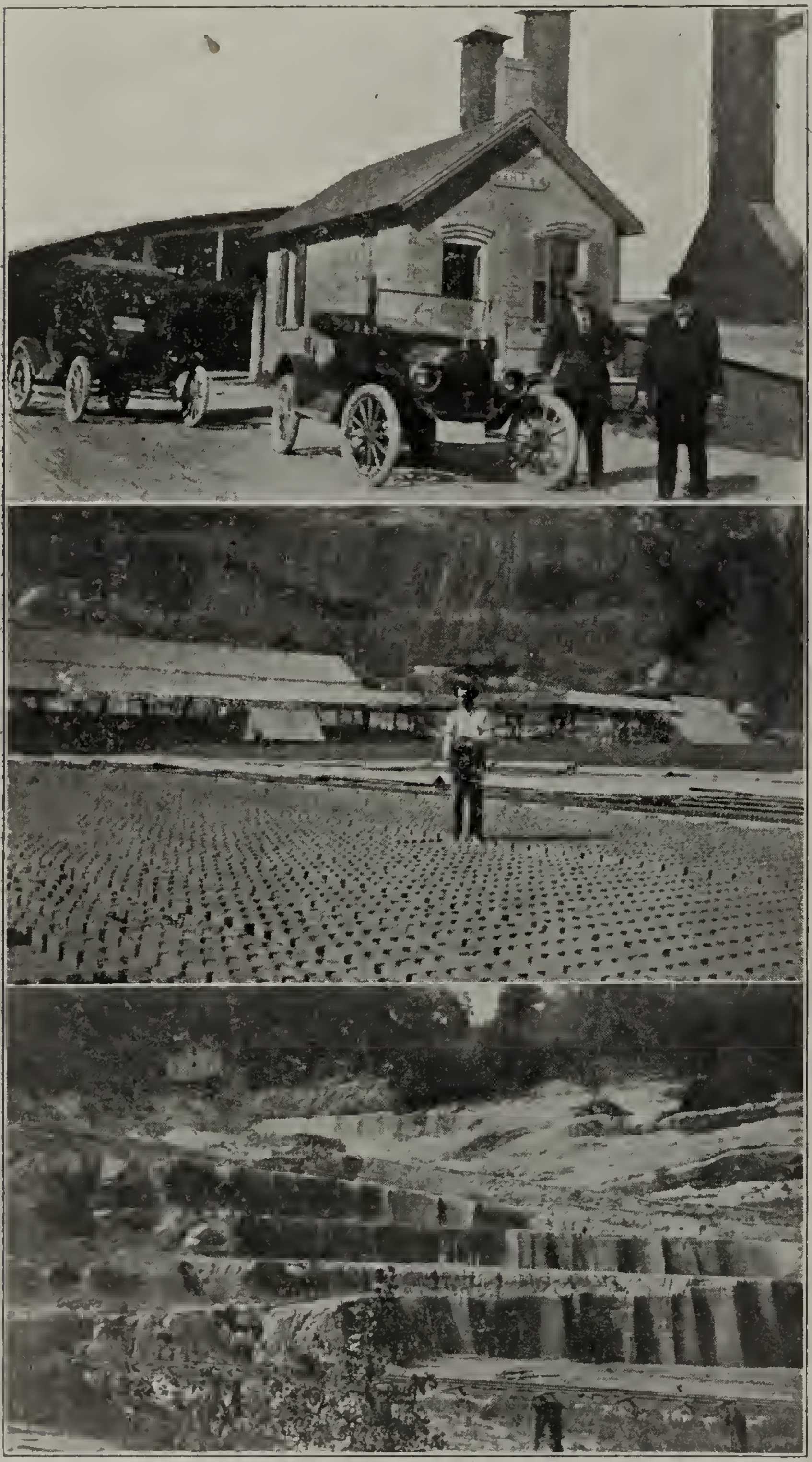
Mr. Hammond: This house you see here is one in which Mr. Randall was much interested. We occasionally have trouble with our burns, the burner puts in too much coal or not enough at the right time, and the result is we get these lammie of swelled brick. This house, which is shown here, is our superintendent's houses, and is made out of those lammie brick. An architect came to my son, who has charge of the sales, one day and said he was looking for something unusual in the way of brick for a garden wall, so my son had him come out to the yard and look at this house. The architect was much taken with it, and wanted to know how much they would cost a thousand. My son said, "Eight dollars is about as low as we can sell that quality of brick," and the architect said, "I will take a certain quantity of them." We later received his check, the contractor did his work well, and the architect was satisfied and the owner got a very handsome brick wall and we got a very good price for brick that we had thought were not fit for anything.



Superintendent's House Built of "Lammie" Brick.

These pictures being shown now are the pictures of the Terry plants, and I want to say I take off my hat to the Terrys as brick manufacturers. Their father and their grandfather before them had lived to a good age, were brickmakers before them and instituted in their own lives the same methods which they put upon their yards. They are said to be the best yards on the Hudson river. There are others who say "Mine are just as good," but with my experience running back quite a long time, the Terry's have always had the best yard.

To begin with, I want to tell you something about the Hudson river. The clay deposits being about thirty-five miles up, at the entrance of Haverstraw bay. If any of you have traveled up the river, you have seen Hook Mountain. There is a point called Cowgills at the entrance to Haverstraw bay which is historic. We, as Americans, are here because Benedict Arnold met Andrea when he landed from the ship Vulture and came ashore just at the Wallack Mountain on his treasonable project. I am sorry I did not know that these views were being taken; I would have been very much interested in having a picture of this Treason House, owned at that time by Joshua Hitt Smith, and old English family. To that house came Arnold and Andrea and, concealed in the bushes, talked over their treasonable project. Finding they could not quite complete it, they retired as the guests of Joshua Hitt Smith, at his home, and there completed the plot which led to the treason of Arnold, which was forestalled later by the arrest of Andrea.



At Terry Brothers' Plant: (1) The Office, the Stacks in the Background Being Those of the Standard Dry Kiln. (2) Drying Brick on an Open Yard. (3) The Clay Bank.

But to resume the brick yard narrative. This is the general view of the Terry plant. On this plant you do not see any brick laying around. That is the way the plant is all the time. The plant was not cleaned up just for the purpose of having that picture taken. I could not say the same of my own plant.

In this next picture you will see the clay bank or benches. They are all clay benches with one or two exceptions. Each bench is a twenty-foot bench except the middle, and the cars come down, as you see, and distribute to the other pits. I do not know whether Terry has installed a track or not. The picture there shows a hand gang.

This next picture is an open yard of brick. You may have heard the story of Artemus Ward, who was a very famous man here as a lecturer. A good many years ago he exhibited a picture in the course of his lecture, and he said, "Now, this, gentlemen, is a picture of a man trying to mount a horse. I have exhibited it for many years as a pile of rock, but it is

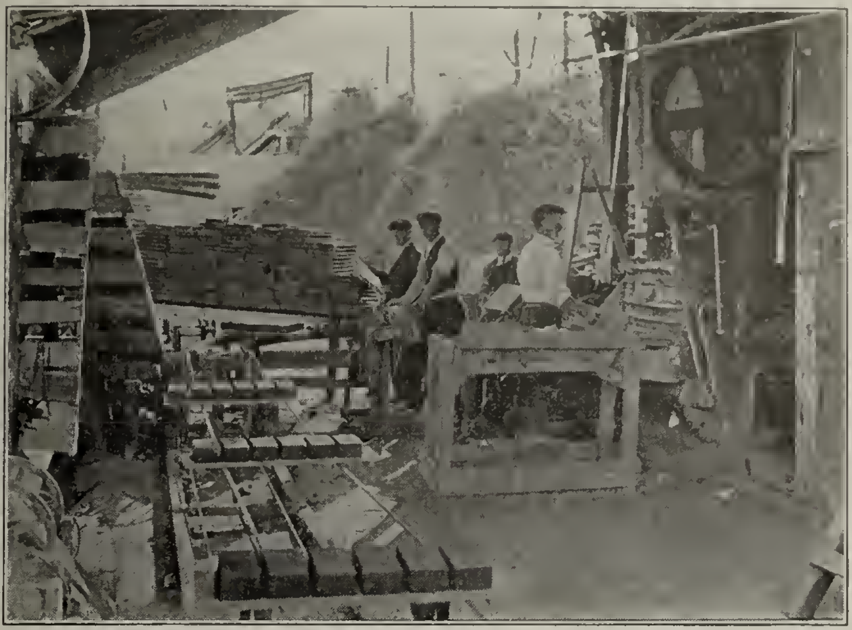
Terry Brothers' Lower Yard at Kingston, N. Y.

Terry Brothers' Upper Yard on the River Front.

Stripping Scove Kiln.

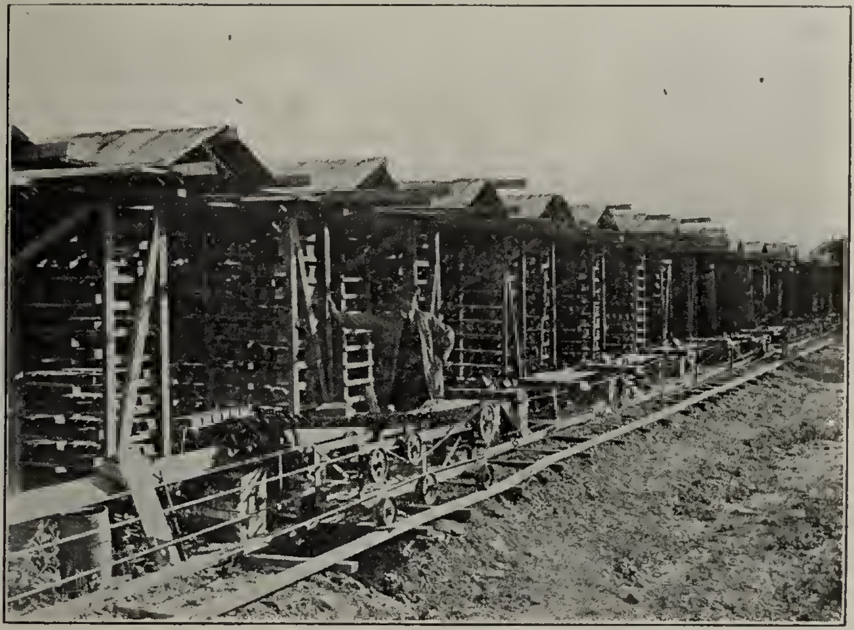
a man trying to mount a horse." (Laughter.) The brick are dumped on the yard on the flat, and after the brick lay awhile, if it is a fair day, the boys come with their edgers and turn the brick upon edge. The boys edge the brick along and take off any edges that are rough. It takes a long time to do this. It takes a longer time on the Terry yard than on others, because their brick must be perfect. Some one may say, "You are advertising Terry." I may be, but I like to advertise the master. He doesn't have his brick tamped on the edge to square them perfectly until the brick are to a certain condition of drying, when they are squared. You see behind the man is a rack of lumber. Those are the battens for covering the brick, or what we call set-up boards, one eleven inches and one twelve inches with batten strips. When these brick are dry enough they are piled up and the battens are put on the side and the saddles are put on over them, and if it rains several days and nights the brick are safe. The stacks in the back of the picture are the stacks of the Standard Dry Kiln Company's dryer which they have recently put in.

Glimpses of Philip Goldrick's Plant, Saugerties, N. Y.



Brick Machine and Receiving End of Carrier.

Goldrick's Drying Racks and Kiln Sheds.



Endless Cable Pallet Conveyor.

Clay Chutes by Which Clay Is Conveyed to Machines.

Vista of the Drying Racks.

The next pictures are views of the Goldrick plant. Mr.

Goldrick and his sons are here and they can tell you all about the plant if they will. However, I will say this is a pallet yard, and you are all familiar with the pallet system. Mr. Goldrick is a good brickmaker and a kindly man. They turn out the best grade of brick possible, and you will see everything about the plant is in order.

Here we are at the machine. You will notice his progressive system; it is an endless cable carrier system; the brick are dumped on pallets, which are placed on the carrier cable, then taken to the racks and deposited with very little labor.

Secretary Randall: The next is the New Jersey brick plants, and Mr. W. H. Taylor will tell you about them.

Brickmaking in New Jersey.

W. H. Taylor, New York City: I may say, gentlemen, when I first noticed my name on the program I wrote to our secretary and said it required a lot of nerve to make up a program without consulting the men whom he assigned a place on same, and he replied that it required a lot of nerve to be secretary of an Association like this. (Laughter.) And since I was here yesterday, I am satisfied he is right. I am sorry that I haven't more pictures to show you. There is none here of the clay bank, but I really had nothing to do with the selection of these views. However, I will say we have a clay bank about forty-five feet high, and we have really three grades of clay, and thus it becomes necessary that we mix them to a great extent. Having that in view, I bought first a steam shovel, and then later I put in a cable drag scraper, which seems to give us the best results up to the present time.

General View of Plant of New Jersey Company.

View No. 1 is a view of the plant; and, by the way, our clay is taken into the clay house, and the house seen there is the storage house or storage building. We formerly took our clay, as you will see by the partly dismantled tracks, into this building here in which are located the disintegrators and crushers; but that was abandoned so as to provide for the clay reaching the sheds more directly and with less belt carrying.

No. 2. This is a view of our dryer. We dry by the hot air system. At first we used the heat taken directly from the coal furnaces, but we found that worked to a disadvantage because of the whitewash upon the brick, so now we are using gas for drying our brick altogether. This picture does not show it, but we have a producer which is to the right of the high stack, and the gas producer and the fan are located just beyond the stack. To the right is shown thirty-nine dryer tunnels, and we use the stacks where formerly we used fans for the exhaust of the moisture.

No. 3 shows the emptying of our kilns, and you will notice how earnestly and hard the men are at work. I may say to you that this is a great deal of the character of work we get at our plant. I do not suppose you have any of that character of men. In taking the brick out from the kilns we have two methods. One is the wheelbarrow method and the other is using the crane. Later on you will be shown some very interesting views of loading in bulk, which was first, at least so far as this section is concerned, I think adopted at our plant.

No. 4. Another view of the plant. You will notice the large pipe to be used with the Underwood burning system. You will notice the duct which leads from the main duct to the lesser one which runs on each side of our kilns.

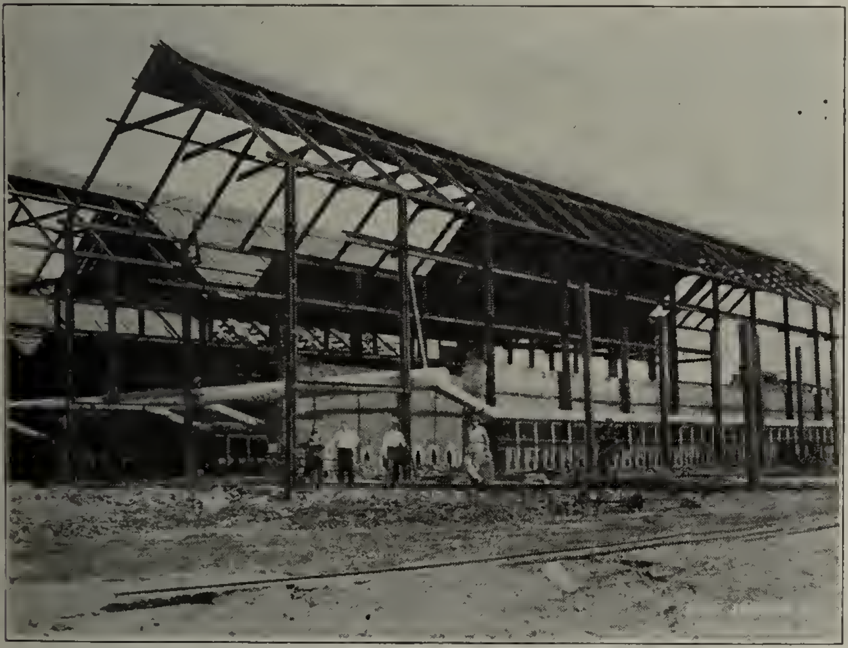
A Member: Are you burning successfully with the Underwood system?

The New Jersey Company's Dryers.

Emptying Kiln at Plant of New Jersey Company.

Mr. Taylor: I do not think I am called upon to speak of any particular system. I was told that the Underwood man would be here to explain fully this method to anyone interested, and if I seem at all halting in any way, you will understand it is because this was thrown entirely upon me without preparation. We have a very peculiar clay which has proved very difficult to burn, due to a great deal of carbonaceous matter in it, which proved a detriment rather than a benefit, so much so that no one prior to my taking over the property of the gas producer we hoped for a number of things. One was to reduce the labor cost, the other was to reduce the coal cost, and the third was to have it cleaner around the place. Of course, incidental to the reduction of labor, the use of the outfit around the kilns would do away with the labor. So far as cleanliness is concerned, it is also very much in its favor. Their idea as to the amount of fuel to be used—now I am speaking, of course, of our own plant—in the burning of our own brick is radically different from what we found had been able to make a real success. With the introduction necessary with the old system, and I am inclined to think they are going to prove it all right. Another thing is that up to this past year (1916) we were making brick by the stiff mud process. We found that so far as our clay was concerned, it is not so smooth and free from hard substances as some other clays, and for that reason it may not have been as adaptable to making stiff mud brick as some other clays were; but so far as we were concerned, notwithstanding the fact that we put in a repress, we could not make a brick that was as satisfactory in appearance as the North River brick; although I think myself it is much better than the North River brick. (Laughter.) I may say, however, it was not as good looking. Notwithstanding that fact, it has met with favor here, as our brick went exclusively into the Equitable building and in the Woolworth building. It would have gone exclusively into the Grand Central if we could have furnished the brick. Out of 14,500,000 brick we put into the Equitable building, we never had any rejected. But it was not what this market wanted, and I found that out after paying for my knowledge. We are now using New Haven soft mud machines, with very good results.

Coal Chute and Gas Producer.


Piping About Kiln for Producer Gas.

Unless your plant was properly located as to the handling or delivering of your clay, you would have to take into consideration the labor involved in handling the clay. You would also have to take into consideration the question of the necessity, not the advisability, but the absolute necessity of using a high-grade gas coal. You cannot use the ordinary bituminous coal, which you can get from any mine and which you can use in your present system, and that is one feature it is well to bear in mind when considering the matter. I believe where conditions are right you will come to gas burning. I think it is an A No. 1 system, and I think perhaps Mr. Underwood has progressed as far as anyone has. Before putting it into our plant we visited a number of other plants, and they were burning brick in down-draft kilns, whereas ours are all up-draft. We have found it advantageous to use up-draft kilns.

No. 5. This view represents the gas producer that is an old style gas producer, and, of course, the rest is simply incidental to it. The container for the coal, with the cars standing there to drop the coal down into the crusher and is then conveyed up to the producer. In connection with that I might say I am about to construct a gas producer to be used in conjunction with that. If you are going to install the gas system, it would be better to use a gas producer.

I might say in conclusion that so far as the brick industry in New Jersey is concerned, all of you no doubt receive the governmental report, and you know the quantity of brick produced and that we are running an exceedingly close second to the North River; but we produce a fair quantity of common building brick, and the clay of New Jersey is a very important factor. I am sorry our secretary did not select someone who has been a long time in the business in New Jersey. I know there are men who have been in the business in New Jersey a long time who could give you a full description of the various plants of the state, while I can only speak for my own plant. (Applause.)

This brings us to the next topic, which is "Handling Brick in Large Units," by Christopher Steadman, of Green Ridge, L. I., N. Y.

"HANDLING BRICK IN LARGE UNITS."

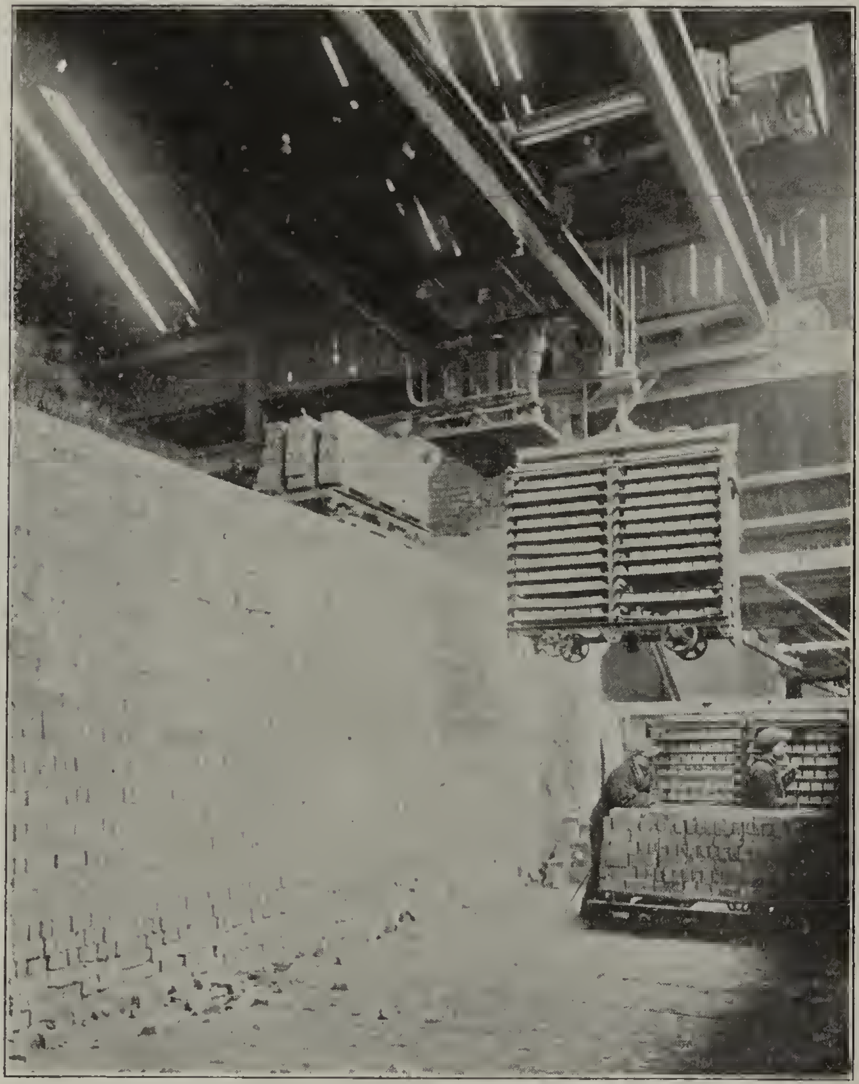
By Christopher Steadman, Green Ridge, L. I., N. Y.

Mr. President and Gentlemen of the Convention—If our secretary had asked Mr. Johnson to show the pictures he showed at Cleveland of their brick handling device, I am sure his pictures and talk would be much more interesting and instructive than any I can show. Johnson & Johnson, of Raleigh, N. C., have built a new plant, and there is no doubt it is the most efficient plant in the country, not excepting Chicago. Johnson & Johnson have the advantage over us that they designed and built a complete new plant, while we had to improve on a plant that had been in operation many years.

Water Front of Plant of Richmond Brick Company.

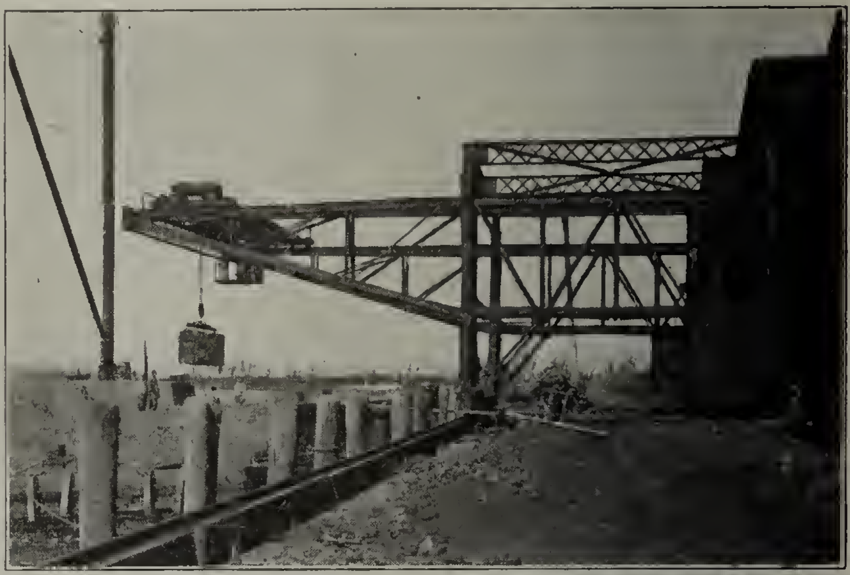
I shall first show you some views on the screen that are interesting from a personal view-point only. My first brickyard picture shows the line of kilns on the water front. Some of the things usually seen about the brickyard are conspicuous by their absence at our plant. You don't see any men pushing wheelbarrows around or any men passing or tossing green brick into the kiln, nor the burned brick out of the kiln. In the second view you will see the crane in operation picking up a car of soft mud brick. We make both soft mud and stiff mud brick at our plant. By handling the brick in bulk we dispense entirely with all passing and tossing and all wheelbarrows, eliminating a large percentage of broken brick. The crane which you see handling the brick is made by Pawling & Harnishfeger, of Milwaukee, Wis. The next picture shows you the traveling gantry on the dock, showing the crane at the extreme end of the gantry, with a unit of 1,250 brick. I could not get a very good picture of this part of the crane, as there were two boatloads of coal in the way—I should say black diamonds that cost $8.50 per ton. I neglected to say, when talking about the hard brick crane and gantry, that they, together with all the shed equipment, were built and installed by the Shepard Electric Crane and Hoist Company, of Montour Falls, N. Y. In all of this equipment we believe we have put in the best on the market, as the best is none too good to do good work.

This gantry projects forty feet over the water and has a counterbalance of forty tons. The gauge of the gantry is thirty-two feet, and it is propelled by a two-cylinder reversing steam engine. The hard brick are loaded in the kilns on skips in units of 1,250 brick, this number being loaded for the convenience of the loaders. We can handle 1,500 in a unit just as well. You will notice again that the men are doing the work here without any passing or tossing of the hard brick. The old method of taking burned brick from a kiln, as you all know, was by one man going to the top, another to the middle, and another on the ground with a wheelbarrow, and still another man to shove the wheelbarrow over wheeling planks, and up and down gangplanks onto the boat, which is very hard work; and it is difficult to get men to do it in these days, and as you see with the crane each man is working for himself, independent of the other, with all the hard work eliminated. Another advantage of this method of loading is that we can load up on skips 50,000 to 100,000 brick in the shed when the weather is too stormy to put them on the boat.



Crane Picking up a Car of Soft Mud Brick.

It has been our idea and endeavor for many years to handle brick in units of 1,500 direct from the kiln to the building in New York. It can be done just as easily as other materials are handled, but the trouble is the brickmakers and the dealers and the truckers and everybody else connected with the brick business in New York are in the same rut they have been in for one hundred years, and it is impossible to pull them out, no matter what inducements they are offered. What an absurd condition it is for a man to pick up six brick on the top of a kiln, toss them to a man in the middle of the kiln, he in turn toss them to a man on the ground, and that man throwing them onto a wheelbarrow, sometimes breaking half of them if not more; and when enough have been handed down to make up the little load of 108 he will then "jackass" them onto the boat, where more men are waiting to pick them up six at a time and stow them on the boat. When they get to New York more men are necessary. Here they handle seven brick at a time, throwing them into a truck, breaking some more of them; and the unloading of brick in New York is done by the very worst kind of labor, and these men practically control the brick dealer, as they work whenever they feel like it. Now isn't such a method of handling brick obsolete and absurd? We are endeavoring to overcome these obsolete methods, and if we don't get there it will not be because we have not worked hard. I thank you. (Applause.)



The Steadman System of Handling Brick in Large Units.

Loading a Barge of Brick.

Emptying a Kiln by the Steadman Process.

President Salmen: The secretary will please announce the next on the program.

Secretary Randall: This finishes the brick yard views for the present. The first real paper on the Friday program is by J. P. Williams, of Milton, Pa., on "The Screened Shale Storage Bin: Its Uses and Some of the Benefits Derived." Mr. Williams is not here, but has sent his paper, which is a very interesting one.

THE GROUND SCREENED CLAY STORAGE BIN—SOME OF ITS USES AND ADVANTAGES.

BY JAMES J. WILLIAMS, MILTON, PA.

Mr. President and Gentlemen of the Convention:

Not so many years ago, at a time when the municipal and State Highway Engineers first began to give intelligent study to the rattler test which had just been standardized, it was noticed that there was a decided variation in some of the tests made on samples taken from the same car, and presumably made out of the same material, and it was at this time that they began calling the manufacturers' attention to the fluctuations in the tests.

The manufacurers now in turn began to make investigations as to the reasons for these fluctuating tests, and in cases where the cause was found to be in the variation in the materials, experiments were at once made with a view of getting a more uniform mix, and after countless costly experiments were made, the screened clay storage bin was finally perfected, so that today it stands practically alone, as the means of getting a constant mixture out of two or more materials, or two or more kinds of the same material.

Nearly all fire clays and shales suitable for the making of pavers vary in composition to a greater or less extent, and the greater this variation in the material, the greater the variation in the rattler tests were found to be, so that it became imperative to a man who had any marked variation in his material, to correct it or drop out of the game.

Before entering on too detailed an account of the benefits accruing from these bins, it might be well to give a short description of the designing, building and operation of them.

The first bins were put in singly, the filling and the emptying taking place at the same time, but the object of the bin was defeated in this method of handling the material, so that all of the latter installations have been put in pairs, one being filled while the other is being emptied.

The bins can be arranged side by side, or end to end, which ever lay out is better adapted to the space. The walls of the first bins were made out of sheet steel, but certain chemical actions took place between the steel and the shale, causing the steel to rust and corrode, so that all of the latter installations have been constructed out of brick, which is not only more durable, but is considerably cheaper.

The capacity of these bins, of course, is a matter for each individual owner to decide, but it is usually found expedient to store up enough material to last a month, as the longer the material lies in storage the more plastic and workable it becomes.

The height, width and length can be changed to suit local conditions, but it is found more desirable to make the bin as long and as narrow as possible, taking care of the capacity in the height. This shape permits of removing the maximum percentage of the contents without the use of any extra labor to shovel the material to the lower or reclaiming conveyor.

Now let us start with the material leaving the discharge or "dust" chute from the screens. This is deposited by gravity, on the upper or tripper conveyor, which runs along the center line of the bin, parallel to the floor, and a certaitn distance above the top of the walls of the bin.

This tripper conveyor is also called the distributing conveyor, as it brings the material from the screens and distributes it in layers over the bin, and is equipped with what is known as an automatic tripper, which takes the material off of the belt and allows it to fall by gravity into the bin, moving all the time, and after it reaches the end of the bin it automatically trips itself and moves back to the other end, discharging the material all the time as it is moving. This process is repeated indefinitely, or, as often as is necessary to fill up the bin. Take, for instance, every time the tripper makes one trip, that is, from end to end, it deposits a layer of say one-quarter of an inch of shale in the bin, so that if the bin is twelve feet high, the contents of it will consist of five hundred and seventy-six layers.

Now the bin if full and the tripper is set to fill the other bin, which in the interim has been emptied.

Now a word as to the lower part of the bin. In the center of the bin, parallel to the floor, and a certain distance above the top conveyor, which is in damper control with the floor of the bin, so that by opening a damper at one end of the bin the material falls by gravity on to the reclaiming conveyor, on which it is taken to an elevator, where it is raised and then conveyed by another conveyor over to the pug mill, ready for making brick.

The floors of the bins, immediately over the reclaiming conveyor, have a series of holes with dampers, spaced at proper intervals, so that as soon as one damper has released all of the material above it, the next one is opened, and this is kept up until the bin is empty, all of the dampers, together with the regulation of the reclaiming conveyor, and the elevator being under individual control of the pug mill man, so that he can regulate the amount of material that he wants to a nicety, even without the use of the usual rotary pug mill feeder, although it is preferable to have this feeder, with a small bin up over the pug mill.

Now we have gotten to a point where it can be shown why this method of mixing materials is absolute. You will recall that this bin has been filled up with a series of horizontal stratas or layers, and in taking it out again, instead of taking it out as we put it in, we take it out just the opposite, or vertically, so that as we open each succeeding damper over the reclaiming conveyor we have a sort of a miniature avalanche falling from all parts of the bin down to the bottom, so that, regardless of how many different kinds of material there were in the bank at the time we started in to fill this bin, when we go to take it out we will get the same mixture on the first end that we tap as we will on the last end that we tap. For instance, we will take it for granted that the bin will hold a month's run. We start in to fill this bin on the first of the month, the material changing up until the end of the month, when it is filled. Now we start in on the first of the following month to empty it, and we will have the identical mixture all the time that we are emptying it, or during the whole of the month following the one in which it was filled, so that as long as we are taking material out of this bin the mixture will be absolute.

Now we come to some of the advantages accruing from the bin. In the first place, by storing the material in its screened form, instead of in its lump form, as it comes from the bank, it is much more conveniently and economically handled and stored, and a much greater quantity can be stored in the same space. In reclaiming material from a lump storage it is necessary to use a gang of men to get it on the reclaiming belt, while with a properly designed screen bin practically all of the material is rehandled without the use of any extra labor. This is an important point, as the storage cost in the screened bin is practically the same cost as the lump storage cost, but the reclaiming cost is eliminated entirely, thus making the cost of the material at the pug mill about the same as if it went from the screens to the pug mill direct.

Another feature is that in the event that anything should happen to the pans, the crusher, the pit or, in fact, if an accident should happen anywhere along the line, from the pit up to the dust chute under the screens, the plant could go ahead making brick, independent of any of the crippled departments. If the bins each held a month's run, the entire pit, crushing and grinding and screening apparatus could be cut out of commission for a month and the plant still make brick. In picking up the reserve again, each bin could be worked alternately, a little at a time, until the necessary reserve was picked up again. In the winter, when the snow and ice seriously interferes with capacity, the pit could be shut down during the bad weather, and, if necessary, a night shift could be put on to pick up the reserve when the weather moderated again.

Another fact has been brought out by the development of the bin, is that some of the flint clays, ganister rocks and hard, flinty shales that are so very short or lean that they cannot be successfully used without a binder to hold them together, after being stored for a month in their finely screened state, go through what is known to the trade as a "sweat" and frequently soften up to such an extent that they make a fairly good product without the use of a binder. Microscopic examinations of these hard clays after they are ground, but before they are screened, reveal the fact that they are composed of sharp-edged grains, which are so hard that it will take some hard instrument to mash one of them, but after these same grains have "sweated" for a month they become soft enough to be mashed with the finger tip. This fact opens up a big field for the use of the non-plastic shales and fire clays which would not ordinarily be used on account of the difficulty experienced with them on going through the machine and the die.

R. A. Whiston, New York, N. Y.

One large manufacturer in the Middle West had a bank that was composed of a variable deposit of yellow clay, running from ten to fifteen feet, under which was a strata of hard sand rock, running about four feet, under which was a deposit of hard blue shale of unknown dept. He found that sometimes he would get a very low rattler, while at others he would get a very high one, and in making experiments he found that when he got a mix with about twelve feet of yellow clay, and by using all of the sand rock, together with about ten feet of the shale, that it made the best rattling mix, so by cutting off the top of the high places on his bank and filling in the low ones, and setting his shovel to cut about ten feet of the shale, he succeeded in making some good blox, but they ran so erratic that he was finally compelled to put in some storage bins to eliminate the fluctuating tests, and now he can almost make a guarantee as to what his product will rattle at before they are burnt.

Another manufacturer in the East found that his material ran so variable that he was forced to give up getting his shale with his shovel, and was forced to go back to the old and expensive method of hand loading in order to get a more uniform mix. Since he has installed the bin, he now works the shovel again and gets a more dependable test than any of his competitors.

Now as to the kinds of material that are adapted to use in the bins. It must be borne in mind that there are several kinds of plastic shales and fire clays that if ground and screened and then stored in a bin would take a small army of men to get out again, on account of its packing in so hard and dense. However, it is pretty safe to say that any material that will go through a dry pan, more especially if the material happens to be wet, without gumming up the screens, will work fairly well in a pan, although this matter should be thoroughly tested out before any definite idea can be gotten.

Generally speaking, however, the shorter and harder the material is the better it is adapted to being stored, while, on the other hand, it is found that if the more plastic materials are ground a little coarser that they work better, in both the bin and in the machine. This is particularly true about certain shales, which, owing to their excessive plasticity, laminate very badly, but by grinding them very coarse and letting them sweat, and giving them very little pugging, they make an excellent rattler. One of the peculiarities of some of this type of shale is that after it is ground coarse and sweated it shows only the minimum amount of lamination, and that is from the auger, and is generally down in the center of the brick, and is not nearly so prolific of bad tests as the surface laminations caused by the die.

Regarding the construction of these bins, there is very little of the work on them that cannot be done by most any ordinary mechanic, so that it is not necessary to go to the expense of purchasing any of the high priced conveyor equipment that is on the market, as pretty near all brick yard men have at some time or other in their career built a conveyor of their own, using hard wooden rollers in place of the expensive steel or cast-iron type. As far as a matter of service goes the old wooden roller will give just as good service as the metal one, and the first cost is less than half. Plenty of room should be left around the reclaiming conveyor, as it is necessary for a man to get around to oil and clean up. The duct in which the conveyor is placed should not be less than six by six and seven by seven would be more preferable. Any ordinary mason can put the foundations in and lay up the walls. Due allowance should be made for the outward push or thrust of the shale, after the bin has become nearly filled, and the walls should be either hog-rodded or sufficient pilasters put up to take care of the thrust of the material.

By a novel arrangement of controlling each damper in the bottom of the bin, the pug mill man can manipulate them without leaving his place at the pug mill, while he also has direct control of the reclaiming conveyors and the elevators, so that there is never any necessity for him leaving the mill to regulate the flow of clay to the pugmill.

A word in conclusion. If your plant is in the need of a reserve supply of material, and there are few that are not, investigate the screened clay bin thoroughly before you decide. (Applause.)

GENERAL DISCUSSION.

Secretary Randall: This paper was to have been discussed by our good friend, Eb Rodgers, of Alton, Ill. Mr. Rodgers found he could not be here, but a copy of Mr. Williams' paper was sent him, and, with his usual forethought, he has submitted his views on the subject in writing.

Mr. President and Gentlemen of the Convention—I want to endorse all Mr. Williams has said as regards the importance and value of a large ground clay storage. We have been using a ground clay storage bin of about one million common size brick capacity, and our experience of several years proves it to be one of the best paying investments on the plant.

I would say that there is very little danger of making these bins too large, as a large quantity of well mixed ground material, always available insures a steady output of uniform product.

There have been many unsatisfactory experiences in storage bins on account of the manner in which they have been constructed, and I believe that the design of these bins should be in the hands of some one who has had considerable experience in conveying and storing clay. Mr. Williams pictures an ideal condition of the pug mill man controlling the flow of the material from the bin to the pug mill. It is well that he should control the operation of the reclaiming belts and elevator, but I have never yet seen a clay that will flow from a bin of any size by gravity, after it has stood in the bin for two of three days. We find it necessary to keep two men on the bin to kep the clay worked out. In filling the bin, we have a sectional hollow box that we carry up over the end discharge hole, building up the the sections as the bin fills. We then start to empty the bin through this box. Should you fill your bin without making this provision, I think you would experience considerable delay in getting the clay started.

I cannot quite agree with Mr. Williams as regards the wood rollers for the conveyors, as you cannot get a sufficiently deep through in your belt with the wood roller. The conveying machinery should be designed by an expert in that line. If you are going to spend the money necessary to install a bin, it will pay to have all the machinery for filling and discharging of ample size and proper design.

I would also urge the installation of an automatic feeder at the pug mill, with a tank over it holding sufficient clay for ten or fifteen minutes' run. This will insure an even feed to the pug mill, thus making the work of the pug mill man much easier and giving an evenly tempered bar of clay from the machine. I am sure anyone having had experience with a properly designed storage bin will give a favorable report of its advantages.

Mr. Williams has mentioned many valuable advantages that I have not touched upon, as I have only mentioned a few points that I thought should have more discussion.

President Salmen: What is next, Mr. Secretary?

Secretary Randall: The next is an illustrated lecture or talk by Prof. Charles F. Binns, of Alfred, N. Y., on "Beauty in Brick." Professor Binns is another gentleman who needs no introduction to an audience of this sort. (Applause.)

BEAUTY IN BRICK.

CHARLES F. BINNS.

Mr. President and Gentlemen of the Convention:

About a hundred years ago John Keats, the English poet, concluded his Ode to a Grecian Urn with these words:

"Beauty is truth, truth beauty, that is all
Ye know on earth, and all ye need to know."

While granting that such a sentiment admits of and even challenges debate this much is sure that a very important part of beauty is truth or, to put the matter in another way, if one should be convinced that an object is false or is not what it pretends to be any pleasure which it might have afforded is lost.

Prof. Charles F. Binns, Alfred, N. Y.

More freely is beauty defined by Shelley:

"As summer winds that creep from flower to flower
Like moonbeams that behind some piny mountain shower
It visits with inconstant glance
Each human heart and countenance
Like hues and harmonies of evening,
Like clouds in starlight widely spread,
Like memory of music fled,
Like aught that for its grace may be
Dear, and yet dearer for its mystery."

Probably each of you has some definition of his own for beauty and in each case it means something that affords both pleasure and satisfaction. If we all had the same ideals of beauty the world would grow monotonous. As when the school boy describing American social conditions said, "In this country a man has only one wife and a woman only one husband, this is called monotony."

We usually think of a brick as an article of utility rather than of beauty, but at any rate it can meet a part of the definition of the poet; it is certainly a thing of truth. It is genuine, if nothing else. We had a saying in England, perhaps it has found a home here. If we wished to express a very favorable opinion of a man we would say he was "a regular brick." He had that soundness and solidity, that squareness and strength which were the properties of a well-made brick, and there was no better comparison.

But when the beauty of brick is spoken of the term refers, as a rule, to brick in the mass. To brick which has been assembled and applied to its proper use, and it is this phase of the subject which we are to discuss.

I well remember the time, and so, no doubt, do many of you, when, if a man built a brick house he had the whole of the wall when finished colored a bright red laid on with a brush and then the joints were ruled with a straight-edge in a clear white. An elaborate and careful piece of work, the appearance of which was decidedly emphatic. From this the style of architecture passed to the carefully selected and shaded brick so that the ultimate color was almost as uniform as before, but the white lines were omitted, perhaps on account of cost.

Suddenly the pendulum swung to the opposite extreme and there arose a demand for culls. The makers of common brick found that they could get a good price for the over-burns and stickers which were pried out of the arches with a crowbar. Black headers, once almost unsaleable, were produced artifically by brushing a color over the ends and in general anything odd, imperfect or unusual was called for.

Then the demand began to settle down to a reasonable and natural appreciation of the beautiful variations which develop in clay wares under normal processes of manufacture. Unless I am mistaken, one of the first buildings to arise under these conditions was the charming little church on Madison Square, in this city, now sadly overshadowed by the Metropolitan building. The church was designed by the late lamented Stanford White, who met with a tragic death some years ago. The brick were made by Sayre and Fisher and nothing more beautiful either in design or production has ever been erected than this building. This was before the days of the rough-face wire-cut brick but the venture paved the way for the advance which has revolutionized the production of face brick in general.

The beauty of brick is a complex and intricate thing. It is composed of many parts some of which are of primary and some of secondary consideration. Of brick when properly used it might be said as was said of Cleopatra:

"Age cannot wither her, nor custom stale her infinite variety." But this would be to leap at once to the conclusion.

I do not propose to discuss the permanence of brick, nor its cost, nor yet its resistance to fire. At the moment we are concerned only with appearance.

H. S. Hamilton, McArthur, Ohio.

First then, brick is interesting. This quality arises out of the natural and subtle variation in which one brick differs from another. The unit of the individual brick in a wall is small, so small as to be separately indistinguishable. This may be illustrated by a comparison. In a wall built of hollow blocks, each say, 12 inches square, any variation in color is clearly visible and therefore obtrusive. Thus when these blocks are used for outer construction either the differences are ignored, as in a factory building, where appearance is considered as without importance or the blocks are selected and arranged in some sort of chequer board fashion. Or in the case of terra cotta where the separate units are large the pieces are coated with a special surface so that the job may present a uniform coloring. In a brick wall neither expedient is necessary. In the modern school of brick designing and brick laying it is recognized that the variation in color is a most valuable asset. The shades and tones blend into each other as the leaves of a tree in autumn and the result is a vibrant play of color which is at once interesting and restful. Restful! Yes, that brings us to the second point. Brick is restful. I think this is an essential part of beauty and yet it is a difficult thing to analyze. Did you ever consider carefully the fact that those things which are most precious and which mean most to our lives are the things most difficult to describe. Perhaps it is that as a general rule we prefer not to describe them. We enjoy them most when they are shut away in our own possession or thought "far from the maddening crowd's ignoble strife." Pardon this momentary digression, it was intended to explain why I find it hard to express in definite terms some of the qualities which appeal to me as well as to you.

I think the color of brick is restful, whether it be dark or light, red or gray. And this is because the color is natural and indigenous to the material. But one can hardly consider color apart from texture or surface, and when the test is applied to this quality of brick the result is quite satisfactory. Let us study this a little more closely. Take a strong lens and examine the face of a brick at close range. It does not matter whether the brick is rough cut, sand molded or smooth faced. There will be differences, of course, very great differences, but the general points are applicable to all. Through the lens and in a good light you will see points projecting from the surface. These points are more or less prominent, according to how the brick was made and in proportion to the magnification of the lens. The light strikes these prominences and throws them into strong relief. Then you notice that, alternating irregularly with the hills and rocks, there are deep valleys and dark caves. Here and there is a boulder or foreign stone, a black speck or a mass of contrasting color. Take away your eye from the lens and look now at the brick without any magnification. All the details have disappeared and one uniform tone of color presents itself. Uniform? No. Casually it may appear to be so, but in the intricacies of the color there are lurking all the subtle variations which the lens was able to reveal. These variations are not realized, but the fact that they are there accounts for the color value of a brick, and this affords the satisfaction or repose which is one element of beauty.

Another important constituent of the complex thing we call beauty is reserve or restraint. We have suffered for years from spasms of acute decoration. One cannot ask for a kitchen stove without being shown an offense in nickel scrolls which serve no conceivable purpose. Perhaps they once were useful in keeping the hired girl busy, but now that she has gone to make munitions the nickel scroll has outlived its usefulness. This is merely an illustration of the symptoms of the disease of which I am speaking. You can mentally multiply cases and save time. Brick is not only immune from acute decoration, but it supplies an antitoxin. One cannot fit scroll saw work onto a brick house. In the first place, brick does not need it, and in the second place brick will not stand for it.

It is an easy step from reserve to contentment, and I think that this is one of the most important parts of an appreciation of beauty. The contentment may be merely with the observer; it may also be with the owner. Some unkind persons, who may or may not be connected with the lumber industry, will say that when a man builds a brick house he has to be content with it, because he can never afford to make a change; but you know what the fox said when he could not reach the grapes.

A few weeks ago a small grandson of mine, whose age is five years, was creeping into bed on a cold night and he was heard to mutter to himself, "I bet I'm going to feel good." Don't you know just how he felt? When you look at a house well built of brick and see how it nestles itself down into the landscape, you can almost hear it saying how good it feels to be just there. And if the house itself looks good and feels good, how about the owner? The street is none too well lighted as you walk up from the office or from the railroad. The house winks at you confidentially as you draw near. It seems to say, "Beefsteak for supper." You have hardly set your foot on the pathway which crosses the front yard when the door opens. A glow of ruddy light enfolds you, and outlined against it you see them all. *She* is holding the little fellow in her arms, but the others run down the steps in spite of the cold and you are dragged in, a willing victim. After supper you light the kindling under the logs and one pulls up the big chair while another fetches the old briar. Then the match must be blown out, and you are sure to need a second one, because each must have one to blow. And then bedtime comes for the kiddies; you and she draw your chairs to the fire to make plans and exchange confidences. Have I woven too much into the beauty of brick? I think not, because there is no place like home, and for satisfaction, permanence and comfort there is no home like a brick home. (Applause.)

Following the reading of his paper, Professor Binns showed a number of interesting views of beautiful brick homes and buildings faced with brick and terra cotta.

President Salmen: I am sure we have all been entertained by this interesting talk. What is next on the program, Mr. Secretary?

Secretary Randall: There was to have been a discussion on this paper by J. Parker B. Fiske, but he was called west and so is unable to be here, and I have not arranged with any one else to take up the discussion.

President Salmen: If it is the pleasure of the convention, I think it will be well at this time to have the report of the committee that was appointed yesterday in regard to the technical investigation. Mr. Taylor is chairman of that committee, and he is ready to report.

Report of Special Committee.

W. H. Taylor: Mr. Chairman and Gentlemen of the Convention—We beg leave to submit the following report of the committee to which was referred the matter of the technical investigation work:

After full and careful consideration of the subject, and having the advice of a representative of the Bureau of Standards, we report that at the present time it is deemed inadvisable that this Association should do anything further in the way of assistance, other than to furnish promptly to the bureau any such products as may be desired, and also such information and data as may be in the possession of this Association or its membership when and as requested by the Bureau of Standards.

This committee further recommends that the Technical Investigation Committee of this Association be authorized to use the funds of the Association for the purpose of continued investigation, in such amount as may be available and necessary.

Signed by the Committee,

W. H. TAYLOR,
WARREN GRIFFISS,
R. G. EISENHART,
M. E. GREGORY,
WILL P. BLAIR.

President Salmen: You have heard the report of this committee. What is your pleasure?

Will P. Blair: I move its adoption.

C. P. Mayer: I second the motion.

Carried.

Will P. Blair: Without wishing to take up the time of the convention, I have a resolution to present relative to highways, etc.

President Salmen: If there is no objection, it will be referred to the Committe on Resolutions.

Secretary Randall: At this point, I think it would be well to introduce a young man who is rather modest and timid, but if he can find his voice, I think he can tell us something of what the Committee on Technical Investigation is doing, Prof. Edward Orton, Secretary of the Committee. (Applause.)

Report of Committee on Technical Investigation.

Professor Edward Orton, Columbus, Ohio: Mr. President and Gentlemen of the Convention—I observe by the program that my report was scheduled for the first session instead of the last. Unfortunately, my duties as secretary of the American Ceramic Society kept me very busy through Wednesday and until about half past seven last night. I regret that I was not able to be here at the proper place on the program.

I will tell the Association very briefly what the situation is. We have been carrying on two separate investigations, the first of which has continued during the last four years. This work concerns the crushing strength of brick piers. This investigation was started on the suggestion of Mr. Will P. Blair, Anthony Ittner and others, as the result of a paper by Mr. James E. Howard, formerly of the Bureau of Standards. That work consisted in building a large number of piers 30 inches square and ten feet high, from brick from different parts of the country. The construction also differed as to mortar and the mode of laying the brick. The piers were built, aged for different lengths of time, clamped compactly in iron frames, lifted from the bed where they had been built, transported to the giant testing machine in the Bureau of Standards laboratory, and there submitted to crushing pressure until they failed. It has been possible to minutely observe the process of the crushing of the piers. The failure was a matter generally not of the brick itself, but a failure of the mortar that was used.

This investigation has progressed steadily, but slowly, and the facts of each year's work have been given to the convention from time to time. Altogether, the tests have cost the Association about $1,160. The brick have been very generously furnished by members of the Association. Our president, Mr. Fritz Salmen, sent a carload all the way from New Orleans. The Greater New York Brick Company sent a carload from the Hudson River district. The Illinois Brick Company sent a carload from Chicago and the fourth series of piers was made from material obtained near the Bureau of Standard laboratory at Pittsburg.

I am very much pleased to report that this investigation is about completed. All the brick have been assembled and all the piers have been built. More than three-fourths of them have been tested. The testing of the last piers is going forward as they become of proper age. The final report of all crushings will be available, I take it, during the next year, in the form of a bulletin of the Bureau of Standards, in which this Association will appear as collaborator.

This Association deserves credit for having planned and largely financed a very valuable piece of investigation regarding the properties of structures in which its material is used. For the first time the architects of this country will have data of the most exact type regarding what loads brick piers may be expected to carry in safety, and how they fail where overloaded.

The next investigation was taken up with the idea that we should start something before the other was completely finished in order that one might overlap the other and no loss of time result. The subject of the next work is the freezing test for brick.

Some of you remember that last year I presented a short talk before this Association on work which had been done on the use of a substitute for real freezing, viz., the sodium sulphate freezing test. I made the statement that we did not need really to care much to prove the crushing strength of brick, because it has been shown that they are not brought to crushing pressures in brick structures. We have reason to think that the ultimate failure of brick can hardly be measured in terms of mechanical strength, for the reason that most brick are really ten times stronger than they need to be to do their work.

The real failure of brick usually depends upon their resistance to the disintegrating effects of weather, and the freezing test has been found in many cases to be the real test of its durability. But the freezing test is not a very easily adaptable test for laboratory purposes. Where we use expensive artificial freezing plants and do it as rapidly as possible, it takes about twenty freezings to find whether a brick is good or not. It does not take twenty freezings to destroy a bad brick, but if the brick is just on the line (and these are the ones concerning which the question is going to arise), then we have to subject them to twenty or twenty-five freezings. In fact, at the laboratory at Ames, Iowa, they have pushed their investigations on some samples as high as 100 freezings. This takes an immense amount of time, and costs a lot of money.

Prof. Edward Orton, Columbus, Ohio.

The idea has been advanced to try out the crystalization of some other body than ordinary water. The crystalization of water into ice we call freezing, but the same physical action takes place when other liquids crystallize into solids. So we tried sodium sulphate, a cheap salt which expands strongly in crystallizing, and we find it much more severe in disrupting a clayware than ice is. How much more severe is a question we cannot yet answer, and how many freezings of sodium sulphate are equivalent to twenty ice freezings, we cannot say.

This work has now been carried on for several months in a comprehensive and systematic study. The time which I now devote to the university is given wholly to research work, and I have a full-time assistant, working eight hours a day, on this problem. This assistant is a man of good type, who has had a lot of experience, has been engineer or superintendent of plants, and is competent to get this work forward and absorb the value of it as it goes along.

We have planned to use twenty samples, selected from twenty states, and representing a full variety of brick. These will be tested both by the freezing and the sodium sulphate test, so that we can see about how many sodium sulphate freezings will do the same amount of destruction as the twenty ice freezings heretofore most commonly employed.

In addition to this, we are making other tests on these same bricks, determining the absorption, cross breaking and crushing strength. When we get through with these twenty series, each of which takes ninety brick, we ought to be able to make deductions of value.

A third piece of work which is being carried on by our committee is in co-operating with Committee C 3 of the American Society for Testing Materials, which deals exclusively with brick. We have undertaken to help them to make a study of the physical properties of building brick from every state in the Union, with a view of drawing specifications for the classification of bricks into grades or classes. Work of this sort had been going on for some time before we undertook to help. I found there were some fourteen state universities which had already co-operated with the committee, furnishing from five to fourteen samples of brick in each state represented. We have pretty clear knowledge as to how products from these districts stand when subjected to the same tests. In order to complete this for all other states, we have sent out circular letters to all the other state universities throughout the country, asking their co-operation in the general testing scheme. We have asked each to collect and test in their states their own materials, according to the program of testing which we have laid down, and which we furnish them on printed blanks. Almost without exception they have agreed to do this. There are perhaps five or six states out of the forty-eight with which we have not been able to get co-operation established. Some of them say they will be able to do it later on. In addition to this, we have asked them to send a duplicate of each sample to Columbus, so it can be also tested there. At the conclusion of the work, we will have a large amount of data of brick tested in every state in the Union, representing every typical ware, made by every process. It should be possible from this data to lay down, with greater precision than ever before, the standard properties which a brick should have to be called vitrified, or hard, or common, or soft.

Arthur S. Watts, Columbus, Ohio.

My talk last year dealt something with the sulphate freezing test and this question of classification. This work was presented much more fully to the American Ceramic Society than it was to this Association, and the tables and data, amounting to twenty or thirty pages or so, were printed, and I now have something like a thousand reprints of this paper. If the members of this Association can use, or want to secure a copy of this paper, I will be very glad, indeed, to furnish them free, through Mr. Randall. I had a sufficient supply printed with this object in view, so that the members of the N. B. M. A., having heard the talk and being familiar in a way with the general field of investigation, could have the data thus far obtained.

I hope very sincerely that the support and interest of this Association will follow the work of the committee in the future as it has in the past. We need what money you give us; we could use more than we have asked for. We should be sorry at this stage to have the support withdrawn, inasmuch as we are using it more effectively than in the past. (Applause.)

M. E. Gregory: I would like to make a motion that we accept Professor Orton's offer to give these pamphlets of a summary of the work of the committee up to this time, and that our secretary be instructed to send to each member of the Association a copy of this pamphlet, and also that we thank Professor Orton for the work that he has done along this line in the most highly approved form.

Charles A. Miller: I second the motion.

Elisha J. Kane: I think it would be a pity to send indiscriminately copies of this pamphlet to members not interested enough to write for them. These things cost labor and money. I do not think they should be sent out to every one. Very many members are not interested. I think if it is announced that Secretary Randall will send them to members asking for them, it will be sufficient.

Motion carried.

Resolutions Relating to Coal Situation.

Secretary Randall: I have a resolution which has been handed in that I think it would be well to read at this time.

Whereas, The high cost of coal is a direct blow to the building of fire-safe homes for the medium classes of people, through the necessary increased cost of building brick, and

Whereas, The high coal price is a menace to the farmer and all other road users in the building of time and wear-proof roads through the use of paving brick; therefore, be it

Resolved, That this convention commend the government investigation of the high price of coal, and that we offer our co-operation in said investigation, and in an effort to make brick home building and brick road building within the means of all.

On motion, the resolution was laid on the table.

President Salmen: What is next, Mr. Secretary?

Secretary Randall: The next is an illustrated paper by Arthur S. Watts, of the Ceramic Department, Ohio State University, Columbus, on "Brick Vitrification."

THE VITRIFICATION PROCESS OF A PAVING BRICK.

BY ARTHUR S. WATTS.

The rigid specifications which a modern paving brick must meet before it is acceptable to most city engineers, makes the study of the process by which it is developed a subject of much importance to the manufacturer.

Like most manufacturing processes, the theory involved concerns the average manufacturer less than the process by which he can make his product meet specifications. But also like all manufacturing processes, it has its peculiarities which, if neglected, are certain to result in trouble, and some of these peculiarities of the paving brick manufacturing process are little understood. We know that a single No. 2 fire clay may be, under certain conditions, developed into a high-grade paver, but generally two clays of different physical and pyrometric properties are required to produce a thoroughly satisfactory product. By far the greatest number of high-grade pavers are produced from shales and in most cases from a mixture of two or more shales of different physical and pyrometric properties.

While the process of preparing the clays, and manufacturing them into the desired form are vitally important, the secret of good paving brick is recognized today as depending largely upon two things. (1) The combination of two or more clays or shales relatively suited to each other, and (2) the proper heat treatment of the mixture to develop each of its constituent clays to its best physical state.

Many clays are naturally unsuited for blending into a paving brick mixture. The fact that they have been associated in nature is no indication that they will produce by intimate mixture a product that has the desired physical properties. When a manufacturer announces that all the material mined must be used in the mix, because he cannot afford to mine a seam of clay and throw it away, he may be, figuratively, standing in his own way. Most paving brick manufacturers now realize that a little seam of objectionable clay may raise the rattler loss on his brick just enough to condemn them. Why is this true? What is the process of development of a good paving brick?

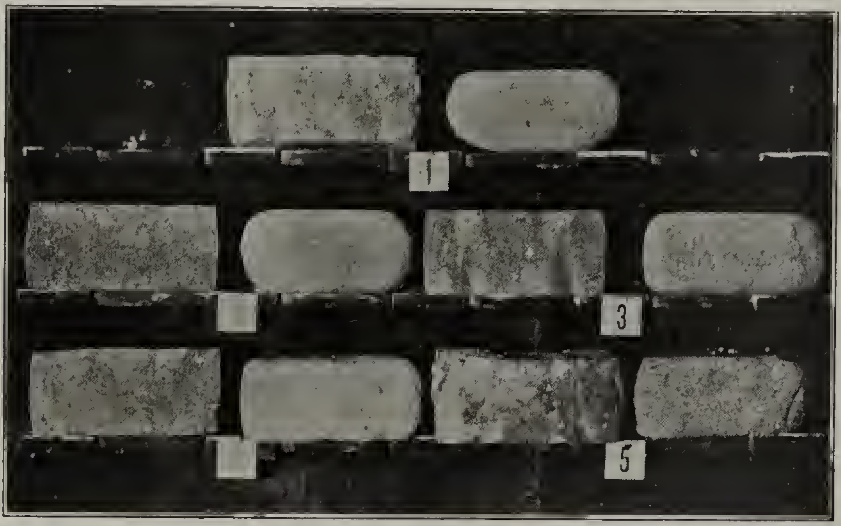
It must first be understood that no two clays or shales are alike. Even though they have the same chemical compositions, they never possess the same physical properties and even though they apparently have very similar physical properties, they may not blend with another given clay or shale to produce the same grade of product. The explanation probably lies in the difference in process by which the different clays have been produced and later transported and deposited in their present bed.

Professor Orton has taught us that "A clay is an earthy or stony aggregate, sometimes consisting largely of a single mineral, but usually made up of many different kinds; it is generally but not necessarily plastic when intimately mixed with water. It contains some hydrous silicate of alumina as its essential constituent. When the content of this ingredient is too low to impart its characteristic properties to the mass in a seasonable degree, the mixture is no longer called clay."

By this we see that a clay, or a shale which is merely a stratified, bedded clay, need not possess very definite properties.

In the consideration of the vitrification process we may consider any mixture of clays as a single clay, since many natural clay beds contain components of vital importance to the ultimate product which are distributed with no more uniformity than is produced by the ordinary mixing treatment to which the average paving brick is subjected.

Treating the paving brick mass as an intimate mixture, what do we find to be its development process? On the application of heat, the necessity for a classification is immediately made apparent. If the mass acts as one mineral, developing uniformly, it falls in one class which is easily understood. If the mass does not develop uniformly, it may fall in any of a thousand separate classes. The early stages of heat treatment are, however, generally considered sufficiently similar to permit of a general treatment. The easily volatile compounds of carbon pass off and a portion of the combined water of gypsum is liberated during the distillation stage, which extends from 200 degrees C. to about 250 degrees C. From 250 degrees C. to 450 degrees C. a great proportion of the carbonates break down CO_2. The sulphur from pyrites and marcasite is partly expelled and the easily combustible forms of carbon catch afire. The necessity for plenty of draft is generally taken care of naturally since the combustion of ordinary coal or even wood is not sufficiently rapid at this temperature to endanger the development of reducing conditions in the kiln at this stage. The critical stage in the burning of some clays occurs at the close of this stage. Such clays as contain much free iron, hydroxide or iron sulphides may absorb carbonic acid from distillation which has not been completed at lower temperatures and iron carbonate is thus produced. This chemical combination breaks up very slowly and an abundance of air is necessary to prevent black coring. From 500 degrees to 700 degrees C. the combined water is liberated from the silicates of alumina of which clay substance or kaolin is the type commonly encountered. The remaining carbonic oxide not previously liberated, chiefly that from dolomite, is liberated at about 700 degrees to 800 degrees C., and shortly above 800 degrees C. the clay may be safely assumed to have completed its process of expulsion of unnecessary ingredients and to be ready to begin its process of paving brick development, as we know it in the vitrification process. Even below this temperature, if conditions are favorable, some contraction has occurred, but the amount is not great in most cases, and there is little evidence of a sealing of the pores of the ware. Just prior to the beginning of fusion of the most fusible constituents of the brick a period of increased shrinkage occurs. This is merely a process of condensation and investigation shows that the porosity is decreased almost in direct proportion to the interstitial portion of the mass.



No. 1. Brick Tested, the Number of Brick Correspond to Classes 1, 2, 3, 4 and 5.

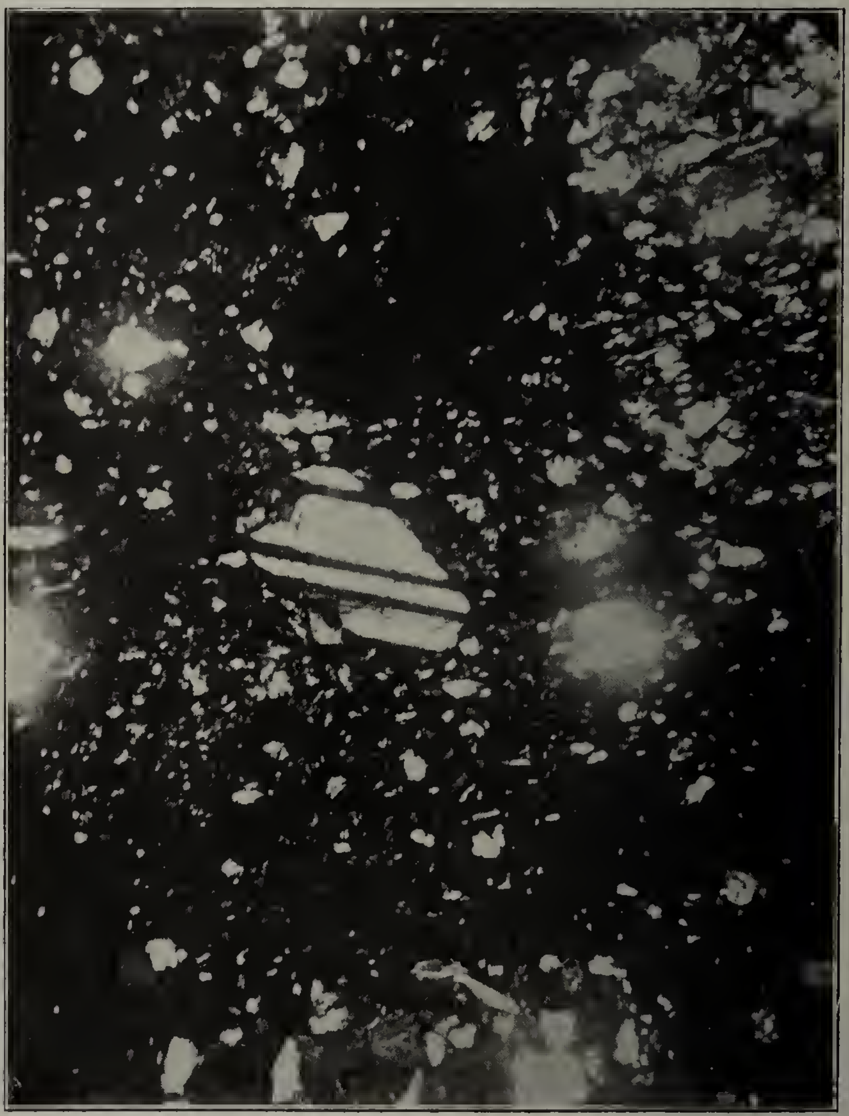
The next step is known as Incipient Vitrification. This may be due to two causes: (a) The fusion of a portion of the mass which is rendered more sensative to the action of heat by virtue of very fine pulverization, or (b) the fusion of a constituent of the mass present in small amount, but of very much more fusible nature than the remainder. In the former case the product will appear dense, but infused throughout when viewed under the microscope. In the latter case the fragment viewed under the microscope will be seen to have centers of fused matter surrounded by opaque material. If this fusible material is confined to a limited area in the deposit it can be easily distributed through the entire mass by finer grinding separate from the remainder of the deposit. The result will thus be made to appear very similar in either case (a) or (b).

If this incipient vitrification is due to cause (a) it will progress steadily to complete vitrification. If due to cause (b) this incipient vitrification may be followed by a period in which the fusion action is only slightly apparent. If the amount of fusible material is large, however, there will be little delay in the process.

The next recognized stage is known as Complete Vitrification. In this state the mass has its maximum density and is commercially vitrified; *i. e.*, it has the minimum porosity possible combined with maximum apparent specific gravity. This is the critical stage in paving brick, for around this is grouped the beginning of the kiln marking and the development of the properties demanded by the purchaser and indicated by the rattler test. As the state of complete vitrification is approved, the mass will be seen to have a matrix or glassy material, filling the spaces between particles of vitreous but undissolved material. This latter will have its edges corroded by the enclosing material, but its angles and general shape will still be apparent.

The next step is Viscous Vitrification. This is evidenced in commercial operation by kiln marking. Under the magnifying glass, it will be seen to consist of a mass of vitreous but undissolved material, completely enveloped by a matrix of glassy material. The edges of these undissolved particles will be eaten away and rounded so that they do no longer wedge upon one another and prevent the mass being pressed out of shape.

If the firing process is continued the product will reach a state called fusion, in which so small a portion remains solid that the mass flows under is own weight. But with the completion of the firing up the pyrochemical reactions have not been completed by any means. As increased solution has been occurring, the matrix has been maintained in a state of saturation possible only at these elevated temperatures. When the cooling process begins, the matrix must throw out of solution such of the dissolved matter as will not go into the compounding of stable materials. The cooling brick may be compared to the cooling of any mineral fusion as regards the crystallizing process. The mineral obsidian is merely a lava which has cooled so rapidly that crystallization was impossible and a glass resulted. If it had cooled slowly, the ordinary gray opaque lava would have been produced.



No. 2. One Hundred Magnifications Under Polarized Light.

Iddings tells us in his book, "Ingenous Rocks," that by a normal process of crystallization we would first have the potash claiming alumina and silica, next the soda must be satisfied, then comes the lime and this is followed by the magnesium. The latter generally combines with the iron present to form ferro-magnesium minerals.

Since the brick have never attained the degree of fusion reached by the lava, the same degree of recrystallization would not be reached, but the difference is only a matter of degree. We may expect a cooling paving brick to develop some crystallization and the amount will be roughly dependent upon two conditions: (a) the degree to which vitrification has progressed and the glassy matrix developed, and (b) the rate of cooling which will regulate the amount of crystalline matter which may separate and also the degree of coarseness of the crystalline matter formed. The higher the firing temperature, the greater will be the amount of dissolved material. The slower the cooling, the greater will be the amount of crystalline material formed and the coarser will be the crystallization.

Now, what does this mean in paving brick manufacture? The important consideration, as I see it, is how far this fusion process should go for best results and how much crystalline material may be allowed to develop to the benefit to the brick product.

It would be impossible to study a large number of paving brick in the short time allotted, but I have secured, through the courtesy of my friend, Mr. F. R. Kanengeiser, of the Bessemer Limestone Company, a set of brick which show clearly the various stages of the vitrifying process. These brick are shown in the accompanying illustration:

No. 1. They were tested for porosity, bulk specific gravity and rattler loss. A description of the members of the series follows:

Class 1. Soft underburned brick. This class of brick has a porosity of 11.37 per cent., a bulk specific gravity of 2.00, and shows a rattler loss of 33.33 per cent. It has a yellowish red color and is full of fragments of quartz and quartzite (sandstone). Chocolate brown particles of iron oxide are also noticeable. Under the miscroscope we see grains of the quartz and quartzite, and large particles of soda and potash feldspar. The soda feldspar occurs in only one variety, known as albite. The potash feldspar occurs to two varieties, viz.: microline and orthoclase. These are identical as regards chemical composition, but differ as regards form of crystallization and optical properties. The microline present is solid and shows no evidence of weathering, but the orthoclase has begun to weather and show signs of kaolinization. Why one of these potash feldspars should be weathered and the other show no trace of weathering is unexplainable. Furthermore, the orthoclase shows evidence of fusion while the microline shows no evidence of fusion. The greater resistance to fusion which is displayed by the unweathered feldspar is perhaps due to its more dense structure. Illustration number 2 shows a piece of this brick magnified 100 diameters and photographed under polarized light, which enables us to recognize the different materials present by their optical properties, which are thus made apparent. In the center we see a large grain of unweathered microline, recognized by its parallel bands. It has sharp unfused edges. Above and below are smaller grains of orthoclase which have rounded edges, and show evidence of fusion. Many grains of quartz are also noticeable, but are unattacked by the fused orthoclase and have sharp angular edges. A grain of hematite Fe^2O^3 also is seen near the center and appears as a black spot. The view in the center of this piece is shown in illustration number 3, magnified to 500 diameters under natural light. In this the grains of clay substance are seen between the particles of quartz and feldspars and show no evidence of solution in the latter. Even the particles of hematite Fe^2O^3 have dissolved little if any in the fused orthoclase.

No. 3. Five Hundred Diameters Under Plain Light.

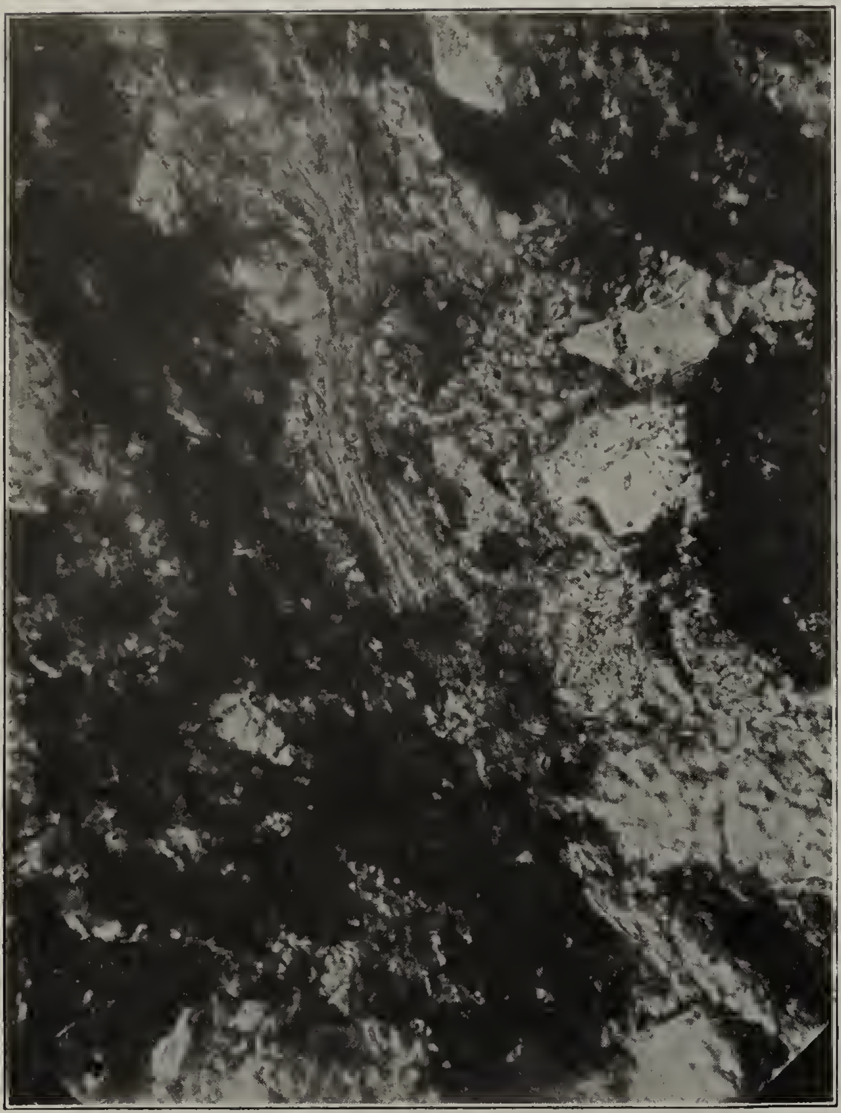
No. 4. Five Hundred Magnifications Under Plain Light.

Class 2. Slightly underburned brick. This class has a porosity of 6.67 per cent., a bulk specific gravity of 2.194 and shows a rattler loss of 26.42 per cent. It is copper red in color, with iron oxide particles, dark brown or brownish black. Clear quartz and quartzite particles are noted in the softer specimen. All the feldspars have changed in appearance and are milky white, shows some alternation, but the microline and albite are still unfused. Small cavities are noted containing a greenish yellow glass. The color of the clay matrix is the same throughout the brick. The most striking change noted by means of the microscope is the advanced solution of the hematite (Fe^2O^3) in the orthoclase, much of which has changed to homogenous glass. Illustration number 4, taken from this specimen, shows no evidence that the quartz grains have dissolved. This photograph is of 500 diameters magnification, made with ordinary light.

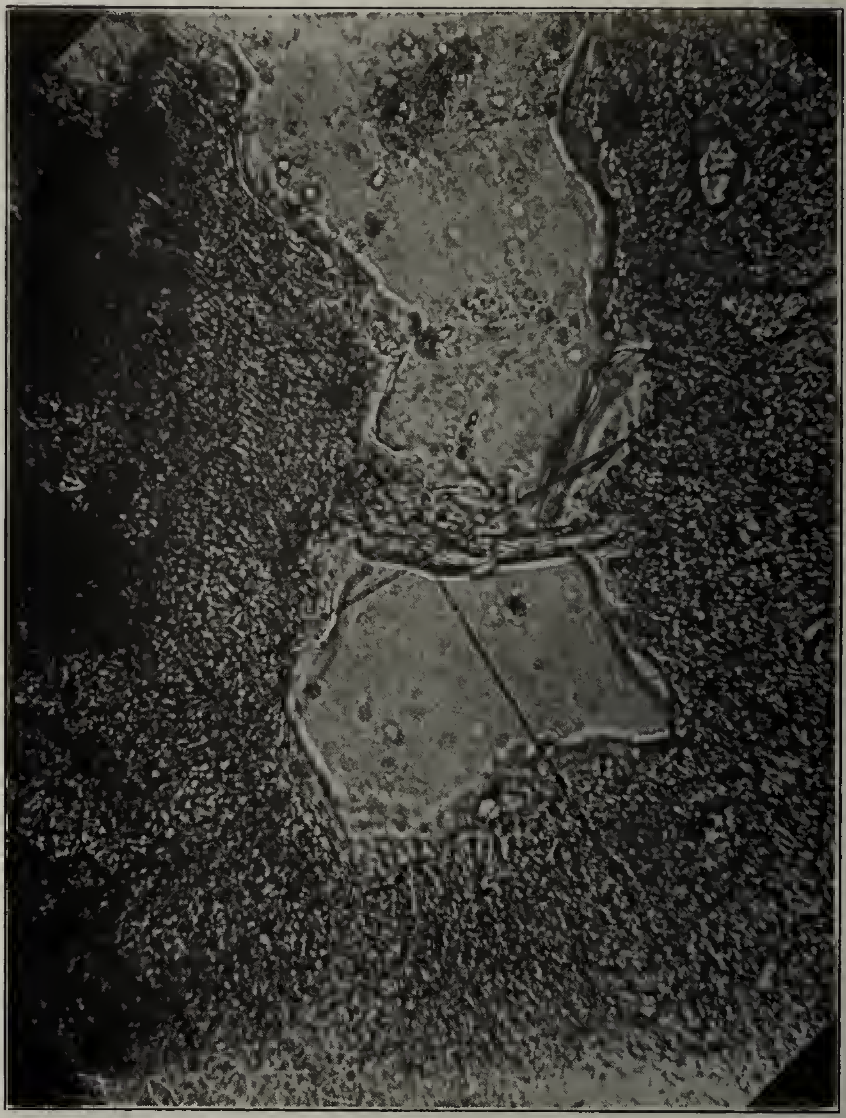
Class 3. Perfectly burned brick. This class has a porosity of 3.64 per cent., a bulk specific gravity of 2.286 and shows a rattler loss of 17.27 per cent. The color has changed to a dark copper red with dark blotches of iron oxide, and white particles of quartz and quartzite. Yellow glass lined cavities are also numerous. The outside of the brick is a darker brown than the interior. Illustration number 5 shows this specimen magnified 5500 diameters under ordinary light. The orthoclase particles show a granular texture with evidence of a few sellomanite crystals (Al^2O^3-SiO^2) developed along the edges. This indicates that the clay substance has begun to dissolve in the orthoclase. The edges of the quartz particles are also slightly rounded, indicating some solution. A grain of mica in the center of the plate shows no evidence of solution, however. The orthoclase has dissolved the adjacent hematite particles, changing it from white to a yellow color. The clay substance also shows evidence of coloration from the iron oxide. In this the brick is at its best.

Class 4. Slightly overburned brick. This class has a porosity of 1.72 per cent., a bulk specific gravity 2.295 and shows a rattler loss of 18.58 per cent. The mass of the brick is mottled, dark brown and black. Many cavities lined with yellow glass are apparent and the iron oxide present is almost black. Illustration number 6 is of this specimen magnified 500 diameters under ordinary light. The fused orthoclase particles are full of sillimanite showing the advanced state of solution of the clay substance. Particles of magnetite (Fe^2O^4) are also present. The cavities in the mass have begun to assume spherical shape, indicating that distortion of the mass has begun. The particles of quartz show strong evidence of fusion. Illustration number 7, taken from another portion of this same brick, but photographed under polarized light, shows how slightly the microline has been affected by the heat. This is only magnified 100 diameters, but shows the twinning lines of the unfused mineral and these lines are only slightly twisted. The albite present is also unchanged. The orthoclase in this specimen is completely fused. The mica present shows very slight fusion.

Class 5. Distinctly overburned brick. This class has a porosity of 2.15 per cent., a bulk specific gravity of 2.24 and shows a rattler loss of 20.31 per cent. The brick is nearly black in color. Evidence of deformation and vesicular pores indicate advanced fusion. Only the clear white quartz is distinguishable in the mass of fused minerals. Illustration number 8 is of this brick magnified 500 diameters under ordinary light. The particles of magnetite and spherical bubbles of entrapped gas are plainly visible. A glassy matrix which has fused from orthoclase and other minerals is of a gray-brown color, and is full of well developed sillimanite crystals. The microline and albite particles are still unfused and the mica only



No. 5. Five Hundred Magnifications Under Plain Light.



No. 6. Five Hundred Magnifications Under Ordinary Light.

No. 7. Magnified 100 Diameters Under Polarized Light.

No. 8. Magnified 500 Diameters Under Plain Light.

slightly attacked, but all are completely enveloped in the fused matrix. The dissolving action of the matrix is distinctly apparent on the edges of the quartz grains.

MINERALOGICAL CHANGES IN BURNT BRICK.

Comparing the microscope examination of bricks 1 to 5, we find the following:

Gradual vitrification of the feldspar. It has been found that orthoclase "melts" before the other feldspars present; that is, the orthoclase loses its crystal properties and becomes isotropic before the microline and albite. In the specimens examined, it was found that the orthoclase showed considerable kaolinization, while both the albite and microline were practically free from chemical decomposition, were bright and clear. After losing its crystal properites and becoming isotrophic, the orthoclase developed a granular texture with the subsequent development of sillimanite in fine needles. By far the greater part of the sillimanite found in the specimens examined is found in the fragments of what had been once orthoclase. The purer feldspars, microline and albite, do not seem to melt or decompose as readily as the weathered orthoclase does. In fact, albite and microline are found in well defined crystals in the overburned specimens number 4 and 5, whereas orthoclase disappears in number 3 and has shown signs of decomposition or vitrification in specimen number 2.

Mica is fairly resistant to fusion or fluxing and is present in all of the bricks studied, although in numbers 4 and 5 the mica begins to show some signs of disintegration.

The iron oxide changes from hematite to magnetite from brick number 3 to brick number 5, at the same time a marked increase in the solubility (solution) is noted with increase in temperature or heat treatment coloring the vitreous bond a yellow or brown.

The quartz is very resistant to change. In bricks numbers 4 and 5 there was evidence of a slight solution, but this was not very great. In all cases the quartz does not absorb any of the coloring oxide of iron, but remains uniformly clear and bright.

The change in color due to change in the character of the iron is very striking from number 3 to numbers 4 and 5.

From the foregoing it is apparent that a chemical analysis has little value as a guide to the fusion behavior of such a paving brick, at least as regards the action of the feldspars. A mineral analysis would show which feldspars are present and be much more valuable. The great strength, as indicated by rattler tests, is developed when the iron just begins to react with the clay and the orthoclase just begins to dissolve clay with the resultant formation of sillimanite.

I want to publicly thank Mr. Kanengeiser for his co-operation in making this study possible. (Applause.)

President Salmen: The discussion of this paper is to be led by Marion W. Blair, of Thornton, W. Va.

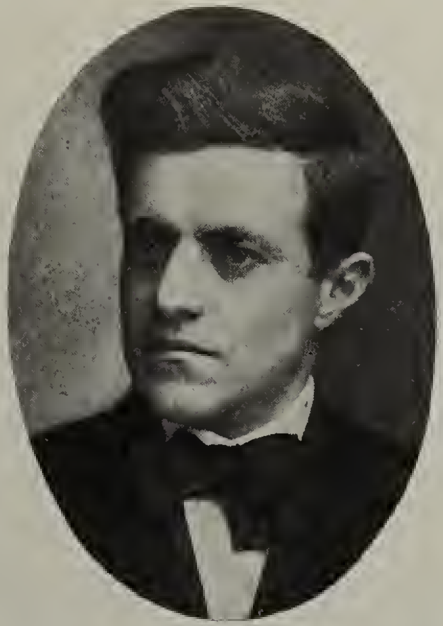
General Discussion.

Marion W. Blair, Thornton, W. Va.: The paper just read by Professor Watts, and the microscopic slides shown, have been of considerable interest. It is unfortunate, however, in my opinion, that so small a difference as 2 per cent. or less should be in any way coupled with a microscopic difference in structure found between two individual paving blocks. It is a sad mistake to leave the impression on any audience or on any reader that a 2 per cent. difference represents enough value to justify looking for it with a microscope. As a matter of fact, the relative value as a paving material of block which test 18, 20, 22 or 24 per cent. has not yet been determined. No pavement built of any one of the above grades in which a reasonable amount of care was taken in the construction, has yet worn out. In fact, it is doubtful if any shipment has ever been made in which there was not at least a 6 per cent. range in the testing quality of the block. A closer range is impractical from a manufacturer's standpoint and without any proven value to the pavement, for our brick pavements are now conceded to be above competition in quality of service and length of life.

Two slides just shown, which I understood to have been taken one-quarter inch apart in the same block, showed marked differences and but emphasize the difficulty in producing block of approximate uniformity from large masses of shale which must necessarily vary in their chemical and physical make up. It is height of foolishness to expect to so dig such raw material with a steam shovel; so crush, grind, mix, form, dry and burn it in 10-pound units, that they shall be all alike. We do mighty well to get the variation within 10 per cent. and be able to sell the product at $3.00 or less per ton.

The engineer should be taught the value of brick as a paving material, as it is now produced; he should be taught some of the difficulties of manufacture, and how impossible it is to secure the absolute uniformity upon which he insists. In fact, many of the engineers who are writing specifications for paving brick have so little knowledge of the manufacture of the material they are using that a specification calling for a microscopic examination of the brick to be furnished would be little more ridiculous than some of the requirements which have already been published. The paving brick manufacturer would scarcely expect to find two slides out of a thousand cut from the same brick sufficiently alike to enable him to draw any conclusion as to cause and effect. And even though he might feel fairly familiar with that one particular brick after such an examination, he would know that the next brick in the column might present an entirely different chemical content or mechanical construction. He would also know that he is helpless to remedy that condition of variation within certain prescribed limits for his particular clay bank at that particular time. (Applause.)

Elisha Kane: May I ask a question? Professor Watts has shown us the situation on the analyst's side and Mr. Blair has shown it from the city engineer's side; but I want to inquire whether quite different results might not have been produced in this internal condition according to the amount of flashing, as we call it, or the action of the reducing flame, or the external color, as Mr. Blair referred to? We know the external color is changed again by reoxidation. In the sample that was shown us, the reducing flame may have been applied to the outside, and the increased heat produced that result. Again, I am ignorant enough not to distinguish properly between what may be called silica solution and that after the chemical change takes place later. May it not be that the chemical solution which takes place that the rapid heatings did not give time for the chemical change to take place, whereas if given more time in the heating the chemical changes might take place? It seems to me that the line of research that Mr. Watts is engaged in is wonderfully interesting and that in its scope it needs to be continued further to take in these points also.


Marion W. Blair, Thornton, W. Va.

Alfred Yates, Shawmut, Pa.: I have been most interested in this scientific paper. It reflects great credit upon Professor Watts, and I would like to inquire if he has ever come across any clays suitable for the manufacture of paving brick where he has seen demonstrated in dollars and cents near the coal measure, or bordering clays, produced by the coal measures?

Professor Watts: My experience with paving brick is rather limited. I have been studying this more or less from the mineral standpoint to find out other clays of the same chemical composition and the same general type. For instance, clays having the same chemical composition don't seem to respond to the same heat treatment, and that was really the occasion of this investigation. I found that I could not tell by chemical analysis the definition between two different kinds of feldspar, at which both fluxes expanded, so we did not get similar results from the same clays or shales analyzing the same, and I think that was the most important points brought out by the paper. Two kinds of clays, practically the same conditions, did not act the same. The investigation was only on one set of brick, fired in the kilns of the Bessemer Limestone Company, under Mr. Kanengeiser, and we cannot say whether the behavior of other clays would be identical with this or not. Now, with the brick at their cross sections in a great many cases the results were uniform throughout, whether taken from the center or the outside.

President Salmen: If there is no further discussion, we will take up the next order of business. I am pleased to introduce one who really needs no introduction, Mr. Marion W. Blair, a "chip off the old block," and one of the members of our Committee on Technical Investigation, who will tell us about the plant of the Thornton Fire Brick Company, of which he is now superintendent, and show us some interesting pictures of same.

BRICKMAKING IN WEST VIRGINIA.

Marion W. Blair: The plant of the Thornton Fire Brick Company, whose offices and display rooms are in Clarksburg, W. Va., is located on the Cumberland Division of the B. & O. railroad, about five miles east of Grafton, W. Va.

After a destructive fire, in 1913, the present thoroughly modern and fire-proof plant, designed by the L. E. Rodgers Engineering Company, was erected. The new plant has been in operation since October, 1914. The buildings are roomy, well ventilated and lighted and are of the steel frame type with brick curtain walls, and heavy galvanized steel roof and gables.

The mechanical equipment is practically all over size for the present output, but it is confidently expected that the latter with grow. The power plant includes three 125 H. P. return tubular boilers. A triple cylinder belt driven pump, delivering water to a reservoir about 300 feet above the plant, and a 28 x 49 corliss engine. The boilers are at present gas fired, but arrangements are already made so that they could be fired with coal by a very few inexpensive changes. There is also an auxiliary engine of 125 H. P. to drive an electric dyamo for lighting and small power purposes about the plant, such as fans, clay haulage, drilling, etc.

Clay Bank Thornton Fire Brick Company.

The clay grinding is done by two nine-foot dry pans, which are set on high foundations with sloping dust floors to the elevators, thus doing away with the necessity of under scrapers. Room for additional dry pans is provided. The pans are fed from a storage shed by belt conveyors and the ground clay, after screening, goes through a ground clay bin to a system of belt conveyors carrying it to the feeder above the pug mill.

The brick machine is a Bonnot No. 11, and is completely equipped with dies for the manufacture of building, fire and paving brick as well as paving block, both repressed and wire-cut-lug, straight, hill-side, three as well as four inch depth.

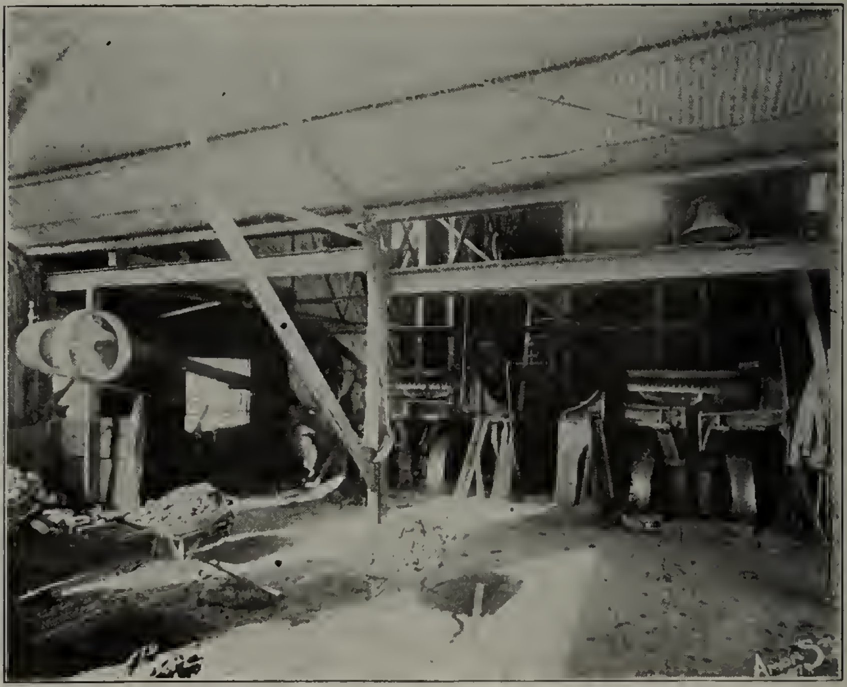
The dryer is of the single track tunnel waste heat type, with ample fan capacity, complete car equipment, auxiliary furnace and large capacity cooling shed.

The kilns are of the round down-draft type, ten in number, they are gas fired and are equipped with both indicating and recording pyrometers.

The raw materials available on the company's property are shales, fire clays and flint. The first is used in the manufacture of building brick and paving block. That used for block vitrifies around 2200° F. The fire clay is a suitable clay for high-grade face brick of light color and can also be used as a bonding material for fire brick. Filnt clay for fire brick occurs in pockets, but in considerable quantities. On

Glimpse of the Kilns, Factory in the Background.

Looking Down on the Plant from the Hillside.



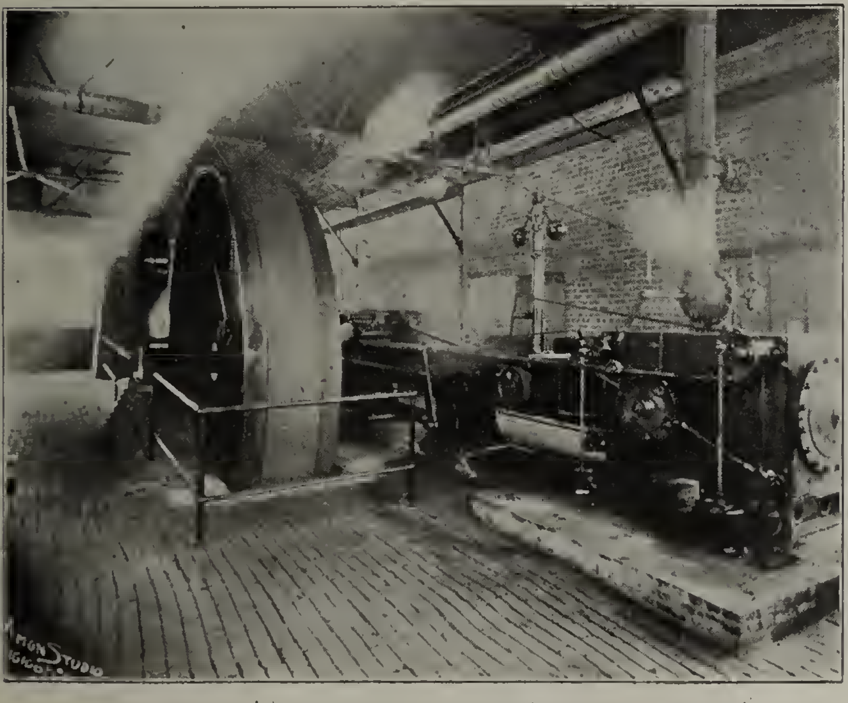
The Dry Pans, Notice Steel Structural Work.

another portion of the property is found a 4-foot vein of high-grade coal under which is also a vein of fire clay some 12 feet in thickness.

It will be readily seen that this plant, both on account of the raw material available and the flexibility of the mechanical equipment is in a unique position to follow closely the demands of an increasing and widening market. (Applause.)

Filling a Kiln With Wire-Cut Lug Brick.

Interior of the Power House.



A Fine Corliss Engine.

Secretary Randall: We are now on the subject of paving brick, and the next number is an illustrated paper on "Brick for Paving Heavy Traffic Driveways," by F. A. Churchill, of Conneaut, Ohio. Mr. Churchill is not here, but one of his associates, Mr. William C. Perkins, will deliver the paper for him.

GENESIS OF CEMENT-SAND BED TYPE OF BRICK PAVEMENT.

SPLENDID EXAMPLE OF WEARING QUALITY UNDER ENORMOUS TRAFFIC EXISTS IN NEW YORK CITY.

BY F. A. CHURCHILL.

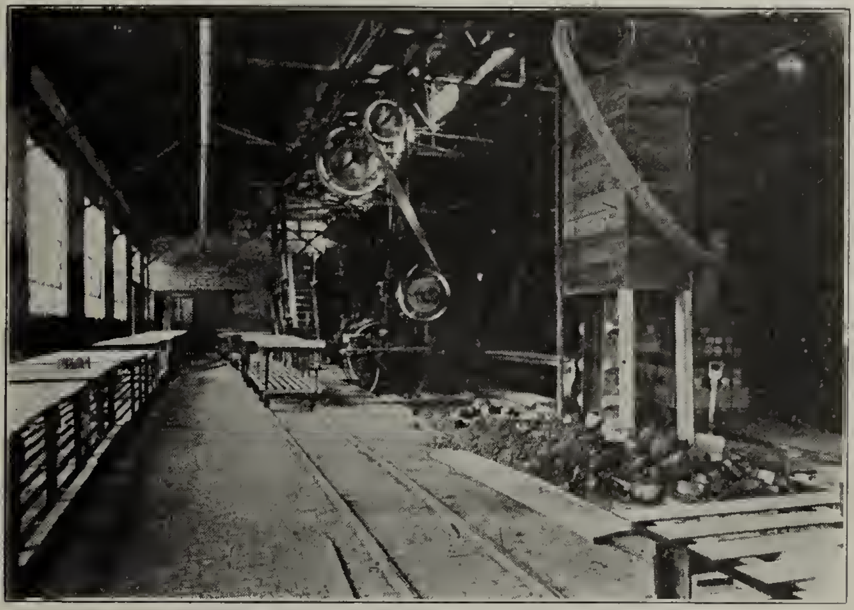
Mr. President and Gentlemen of the Convention:

Those of us who reside in the interior have been told that New York regards itself as a few lengths ahead of all other sections in almost everything, and intimations reach us from time to time that in its estimate of itself New York cannot always furnish specifications.

As an instance at point, New York has been very backward in adopting brick pavements and apparently it does not hold them in esteem for serviceable qualities. Yet to New York belongs the credit for having given the initial impetus to a revolutionary movement in brick paving methods.

The amusing feature of the situation is that although New York is complacently ignorant of this valid claim to distinction, the country at large is becoming well advised of the fact, a circumstance which attests the truth of the old saying: "The zone of visual neutrality is at the end of one's nose."

In these latter days everybody who is in touch with paving matters knows about rigid base construction for brick pavements. In one type, known as monolithic for country highways, the brick are laid on a green concrete foundation. In another type, called semi-monolithic, designed for city streets, a cement-sand bed, converted into mortar, binds the brick to the foundation. In each case the brick are bonded together with cement-grout filler.



A Section of the Machine Room.

It was the cement-sand type which New York City was indirectly instrumental in promoting, and which seems destined in the near future to supplant all other types of construction of brick pavements for city streets. Some cities, such as Baltimore and St. Louis, already specify this type exclusively, and many other cities are using it almost exclusively.

Semi-monolithic pavements were reduced to a scientific specification basis in the year 1915, but many New Yorkers are ignorant of the fact that brick pavements are used quite generally elsewhere and that one of the first semi-monolithic brick pavements ever built has been in service in this city for several years.

The annual output of vitrified paving brick in the United States, according to government reports, is upward of 950,000,000, and eventually nearly all this annual product will be laid on a rigid base. Therefore, it behooves New Yorkers to acquaint themselves with the genesis of this type of pavement, as peradventure Little Old New York may thereby find additional cause for preening its pride because of its leadership.

It is noteworthy, however, that neither the municipality nor any of its engineers can claim credit in this connection. The well-known architectural firm of McKim, Mead & White designed the pavement in 1908, and it was laid in 1909-10 on the Thirty-first street and Thirty-third street approaches to the Pennsylvania Railroad terminal.

Equally worthy of note is the circumstance that in designing the pavement one of the main objects appears to have been quite as much to obtain ornamental effects as to assure serviceability.

But whichever motive predominated in the architectural mind, both objects were attained in full measure.

Although the architects knew little about brick pavements, they designed better than they knew, and, it must be admitted, better than paving engineers had put in practice.

If McKim, Mead & White had been paving engineers in 1908, they would have designed a pavement in which the brick would have been laid on a 2-inch sand cushion, superimposed upon a cured concrete foundation; but, being architects, the designers laid the brick in a cement-sand mortar spread over a concrete foundation, very much as tile flooring is laid.

Of course, the brick were bonded with a cement-grout filler.

Perhaps few of the hundreds of thousands of persons who pass daily over the Thirty-first street and Thirty-third street approaches to the Pennsylvania terminal have any idea that it was by observing these pavements that engineers were led to experiment with, develop and perfect the cement-sand bed type of construction for brick pavements, and thus to inaugurate an engineering practice destined to revolutionize brick paving methods in cities.

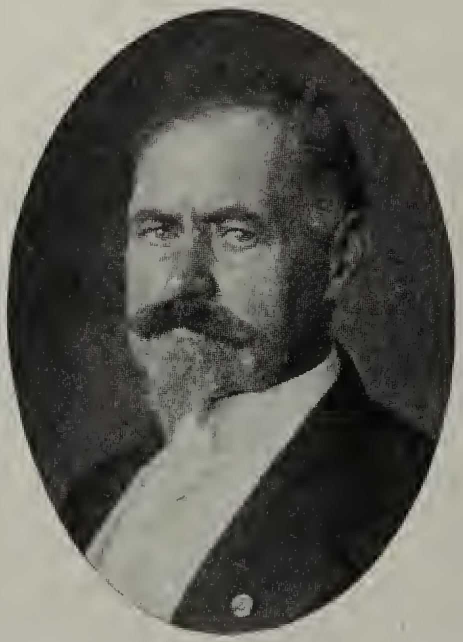
Other isolated instances of pavements embodying the cement-sand bed principle were known of, but the service rendered by the Pennsylvania terminal pavements gave final and positive direction to engineering activities in that regard.

The work of construction was begun in 1909 and it was finished in February, 1910. The contractor was C. C. Hendrickson, of 20 West Thirty-fourth street, New York.

Each driveway has a grade of about 6 per cent. on the incline, or ramp, for a distance of approximately 200 feet. From the foot of the incline to the baggage platform the pavement is level.

On the level stretch vitrified fire clay brick 3½x4x9½ were laid. They were buff brick with square edges, and they were laid in a 1½-inch mortar superfoundation, mixed 1 part cement and 3 parts sand, and spread over a 6-inch concrete foundation. The cement-sand bed was slightly dampened and then tamped before the brick were laid and wet down.

The brick on the incline were 2½x2⅜x7 inches. They were buff-colored brick with square edges, except that one edge was beveled in order to afford a foothold for horses.



F. A. Churchhill, Conneaut, Ohio.

The brick were carefully selected like face brick, so that each should be perfect in dimensions and color, but so far as is known they were not given an abrasion test.

The specifications read: "The brick are to be laid in Portland cement, mixed 1 to 3, with clean, sharp sand. They are to be well bedded in the mortar, and, after laying, the joints shall be grouted with Portland cement."

Although the brick had square edges, they had no lugs to space them automatically in the courses, and it was necessary to do the spacing by hand.

At the entrance to the driveways proper, on the inclines, the pavement was worked out in ornamental designs, but on the level stretches the brick were laid herringbone fashion, at an angle of about 60 degrees.

There was no apparent structural advantage in this method of arranging the brick, the objective being ornamentation.

Although the brick had smooth sides, and therefore offered a less adhesive surface than a rough, wire-cut side for the bond, and although the brick on the incline were much shallower than a standard paving brick, the enormous traffic the pavement has sustained for seven years is a convincing demonstration of the durability of the cement-sand bed type of rigid brick pavement.

In order that you may comprehend the enormous service which these pavements have been called upon to give, I cite you to a traffic census taken for the week of May 22-29, 1916.

This traffic census was supervised by Mr. Dana McComb, of New York, Associate Member of the American Society of Civil Engineers, and a member of the Permanent International Association of Road Congresses.

Mr. McComb was assisted by students of Columbia University, all but one of whom were from the School of Engineering. Three were taking post-graduate courses; the others were graduates of the class of 1916, and Mr. McComb states that all the men engaged on the work were men of absolute integrity and reliability. The engineering department of the Pennsylvania Railroad heartily co-operated with Mr. McComb and in every way facilitated his work.

The census was taken for every hour of the twenty-four and covered the time from midnight, May 22, to midnight, May 29.

During the week 23,688 vehicles of all kinds went over the Thirty-first street approach, including 4,900 iron-tired vehicles, 410 rubber-tired wagons and carriages, 1,650 auto trucks and 18,382 automobiles and taxicabs.

Exclusive of vehicles carrying human freight, the wagons and trucks carried over this pavement during the week 9,909 tons, or approximately 20,000,000 pounds of baggage and express freight, an average of 1,415 tons, or nearly 3,000,000 pounds, daily.

During the same period the Thirty-third street approach showed a total of 31,448 vehicles of all kinds, including 2,923 iron-tired vehicles, 364 rubber-tired wagons and carriages, 948 auto trucks and 27,214 automobiles and taxicabs.

The total tonnage on this pavement for the week, exclusive of vehicles carrying passengers, was 5,874 tons, or 11,748,000 pounds, equivalent to 840 tons, or 1,680,000 pounds, daily.

This traffic census was taken at the instance of the Dunn Wire-Cut-Lug Brick Company, of Conneaut, Ohio.

Notwithstanding the enormous traffic which has continued day after day and year after year for nearly seven years, with very little variation in volume, the pavement shows no cracks, no settlements, no grout out of the joints, no evidence of crushing and no serious wear on the brick except along the curb, where the grinding of locked wheels has worn a gutter in the brick perhaps ½ inch deep and 2½ inches wide. The Thirty-first street approach makes a right angle turn at the foot of the incline.

The loaded vehicles passing over this pavement vary in weight from 2,500 pounds to 12,000 pounds, with a general average of 3,000 pounds.

Nowhere else, perhaps, in the United States has a brick pavement been subjected to a more severe traffic test than has been given the Thirty-first street driveway of the Pennsylvania terminal in New York City.

Approach to Pennsylvania Railroad Terminal, New York City.

You may be interested in a brief summary of the advantages possessed by a modern type of semi-monolithic brick pavement, of which the Pennsylvania Railroad terminal in this city was a forerunner:

Semi-monolithic or cement-sand bed brick pavement is superior to the old sand cushion type because—

First—It assures greater slab strength and durability.

Second—It makes a rigid pavement from surface to sub-base.

Third—It eliminates weather hazards during construction.

Fourth—It makes a practically noiseless pavement.

Fifth—It reduces required depth of foundation and of brick.

Sixth—It overcomes defects which result from the use of the sand cushion. (Applause.)

General Discussion.

C. P. Mayer: We have had a most excellent demonstration of the wearing quality of brick right under the noses of the New Yorkers and it might be an eye opener to them if these pictures could be published in the daily papers.

Secretary Randall: I think it would be very desirable. It was our hope that this demonstration would be so interesting that the New York papers would take it up, but the public press today, more than ever before, is so engrossed in matters of world interest that they are giving very little attention to this convention.

Will P. Blair: I would like to make one point in connection with this paper. I notice that the author of the paper gave credit to the architects who were in charge of the construction of that immense structure. Now, I want to say this. That so far as that pavement is concerned, the matter of the pavement was taken up and discussed by some of the best engineers of this country, and I really think that following all that discussion, that if any one is entitled to credit for this pavement, it is Mr. B. Varellman, formerly street commissioner of the city of St. Louis, who always contended that this lateral construction was the very thing which ought to be adopted in this country, and that question was taken up with him and discussed by the architectural firm with the corps of engineers of the Pennsylvania railroad, before it was finally decided to put in that form of pavement.

President Salmen: I believe the next is an illustrated paper by our friend, John W. Sibley, on "Brick Paving for City and Country Highways."

BRICK STREETS AND HIGHWAYS IN THE SOUTH.

BY JOHN W. SIBLEY, BIRMINGHAM, ALA.

Mr. President and Gentlemen of the Convention:

There is no question before the American public to-day that is receiving more consideration than that of street and highway construction.

The South has endeavored to keep abreast of the times in such matters, and promptly looked with favor upon the use of vitrified brick in paving the city streets.

The first paving brick plant in the South was established some thirty years ago at Robbins, Tenn., on the Cincinnati Southern Railway, manufacturing same from a bastard fire clay that underlies the coal seam. There are in the city of Chattanooga to-day several streets paved at that time with this brick, which are still giving good service, and have cost very little for repairs. Chattanooga's example was soon followed by Lexington, Ky., Pensacola, Fla., and Jacksonville, the success of whose brick streets led numerous other cities to adopt vitrified brick, and the Robbins plant has been in continuous operation down to the present day, having been enlarged several times.

At the Bottom of the Incline, Pennsylvania Railroad Station.

In 1894 the writer began the manufacture of paving brick from shale at the Coaldale, Ala., plant, and I wish to state that this enterprise owes its conception to the knowledge obtained by me in attending the early conventions of the N. B. M. A., where the subject of paving brick was so thoroughly discussed. I had been making building brick out of valley clays, in utter ignorance of the possibilities that lay dormant in the hills of shale on each side of the valley. Coaldale blocks were the first to be laid on natural sand soil at Jacksonville, Fla., and thus began a type of construction that has enabled many cities to get good pavements without the added cost of a concrete foundation, which was quite a factor in Florida, South Georgia and the gulf coast section of Alabama and Mississippi, where freight rates are high.

In 1895 I began construction of brick streets in the city of Montgomery, Ala., and kept it up continuously for several years, that city now having a great many miles of same, with only nominal cost for repairs during the past twenty-two years.

This was followed by rapid use of brick for street pavements in Birmingham, Atlanta, Macon, Tampa, Savannah, Charleston, New Orleans, Mobile, Meridian, Jackson, Memphis and scores of other cities and towns throughout the South.

Beginning with one plant at Robbins, Tenn., thirty years ago, with a capacity of six million per annum, the industry has increased so that to-day there are six plants, with an annual capacity of seventy-five millions of paving brick.

Lord Macaulay, in his History of England, said: "Of all inventions, the alphabet and printing press alone excepted, those inventions which abridge distance have done most for the civilization of our species."

The good road, the public highway, has ever been a barometer of civilization. The good road invariably marks the outpost of all advancement in science, art and commercialism. This is more true than ever in our present generation. Being a part of the daily life of the people and the connecting link between city and county, it has become a necessity. In fact, the progress of any community, state or nation is gauged by the condition of its roads.

The very commercial existence of same demands good roads, and to be commercially profitable the roads must be so constructed and of such material as to be permanent, economical and satisfactory.

Permanent to a degree that they shall be unaffected by the elements or traffic;

Economical in first cost and in maintenance;

Satisfactory in that they shall present the minimum traction resistance—smooth, not slippery—and free from dust and mud.

No section of this country needs good roads like the South, and it is a sign of a better day that statesmen, industrial leaders and the people at large are becoming enthused on the subject. The press of the South, with its customary sagacity in molding and crystallizing public opinion, has not only pointed the way, but given lavishly of its space to promote the cause. Some one has well said: "The development of the South means enrichment of the Nation."

"A few centuries ago the pack horse was the means of transportation, but he was superseded when wheeled vehicles came into use, and in this day it is apparent that the determining factor of traffic will be the mechanically driven vehicle, with its ever-increasing volume and weight of loads and high speed.

"These changed conditions are introducing new elements of destruction, and what were once considered first-class roads are now becoming obsolete, extravagant and wasteful.

"In fact, *permanency* has become the keynote in all construction work, as witness our modern fireproof homes, schools, office and public buildings, and this applies with greater force in the matter of road construction. Let us have permanency, is heard on every side. Temporary makeshifts no longer answer. At last we are learning that building well to-day means less expense in the long run. But, says some one, what is permanency in road building? What is a *permanent highway?*

Driveway Leading to 33rd St., Subject to Very Heavy Traffic.

"It is one that is built of material that is durable; one that resists wear and tear and the destructive forces of nature, that withstands the ravages of time.

"No road that requires constant repairs to keep it in a usable condition, or that must be resurfaced or rebuilt in a few years, is a *permanent* road.

"A *permanent* road is not only built for the present generation, but that to come, and it should not be a burden on the taxpayer. A highway that does not outlast the bonded indebtedness that made it possible had better not be built at all."

The one road material that has stood the test of traffic and time is vitrified brick.

In 1909 the city of Jacksonville, Fla., decided to build an experimental brick highway a mile in length, laying the brick on flat, with sand filler, and using second quality brick. While this was an inferior type of construction, the results were so satisfactory that five miles additional were built by the county the following year, and then a bond issue for one million dollars was voted by Duval county, all of which was used in building brick highways.

This was giving brick a severe test under most unfavorable conditions. Other types of paving were laid in that county under first-class specifications. What has been the result? Thousands of dollars have been expended in maintenance and repairs to make the other types usable with any degree of satisfaction. On the brick roads nothing has been spent for repairs and the wear on the brick has been insignificant, though by reason of the crude construction and the irregularity of the second quality brick, there are depressions and displacements. The county can, at a modicum of expense, take up the depressions and relay the brick, getting a number of years additional life out of the brick, or, by filling the joints with pitch, get a much larger life with a smoother surface.

Some three years ago Hillsboro county, encouraged by the results in Duval county, as well as the splendid record of the brick-paved streets of her own city of Tampa, voted a million dollars for brick roads, and early in this year completed the splendid system, as far as the bonds would permit.

Following closely on the heels of Hillsboro came Orange county, with Orlando as a central point, with a $700,000 bond issue and the construction of seventy-five miles of as fine brick highways as can be found anywhere in America.

Through this county the Dixie Highway extends for forty-two miles, a solid ribbon of brick, and Osceola county has extended it three miles, to the town of Kissimmee.

Following the advice of their most efficient and far-sighted engineer, G. R. Ramsay, Orange county inaugurated the use in highway construction in Florida of brick on edge, with cement grout filler, which is recognized by the United States Government as the highest standard of construction for brick pavements. The completion early this year of the Winter Park, Maitland and Lake Barton grouted brick roads has not only made them the motorists' delight, but established a standard of permanent construction that has been adopted by numerous other counties in Florida.

Delegations from other Southern States have inspected these roads and recommended similar type for their own in highways.

Almost coincident with Orange county was the voting of $750,000 by St. Johns county and the connecting with the Duval county part of the Dixie Highway, taking it through St. Augustine to the southern boundary, a total distance of seventy miles.

This system was completed this year and bids are being asked for an additional mileage for lateral connecting roads.

During last year bond issues aggregating nearly three millions of dollars were voted for brick roads by Volusia, Seminole, Putnam and Pineallas counties, and the contractors are rapidly completing the construction of same.

Osceola county will build fifteen miles, thus making a total of something over two hundred miles of brick highways between Jacksonville and Tampa.

C. B. Harrop, Columbus, Ohio.

DeSoto county this year completed some fifteen miles of grouted brick highways near Wauchula, being the most southern point in the United States where permanent highway construction has been done.

The wisdom of these Florida counties in building roads with a view to *permanency* will have a marked effect upon other sections of the South that are contemplating the expenditure of millions of of brick highways. As a certain eminent consulting engineer in other sections of the South have plans under way for construction dollars in highway construction.

In fact, numerous counties in South Carolina, Georgia and the South recently said to the writer, "Brick is the aristocrat of paving materials, when permanency is considered," and under the law of "the survival of the fittest," it has come into its own in the South, and doing its full share in promoting the commercial welfare and conducing to the health, comfort and happiness of the people.

NOTE: Mr. Sibley's paper was profusely illustrated with views of brick-paved highways in various sections of the south, demonstrating that the southland is abreast of the times in matters of highway improvement. We are unable to reproduce the views at this time, but hope to do so in the near future.

President Salmen: I am sure we all are much obliged to Mr. Sibley for this splendid talk and the views he has shown. I regret to say that we were unable to get the pictures of our plant made, after we had promised Mr. Randall that we would. We will have them next year and will be glad to show you all how we make brick in the South. What is next, Mr. Secretary?

Secretary Randall: The next in order is "Brickmaking in North Dakota," by W. D. Richardson, of Hebron. As you will remember, we announced in the opening session that Mr. Richardson was unable to be here and tell us about this plant, but a friend of his is here who will give you a personally conducted tour over this plant, which is very interesting. Mr. C. B. Harrop, of Columbus, Ohio, will take Mr. Richardson's place.

BRICKMAKING IN NORTH DAKOTA.

C. B. Harrop: The first of the views to be shown is that of the factory of the Hebron Fire and Pressed Brick Company, as seen from the side on which the clay comes in. They use periodic kilns and the Richardson Producer Gas Kiln. The second view shows the Richardson continuous kiln to the left, the Flood kilns to the right, and on the extreme right is the clay preparing department, the storage bins, with the stacks of the periodic kilns in the background. In the next view are shown the three gas producers, in which is made the gas for the continuous kiln. They are of the R. D. Wood type. One of these producers is in operation as a rule all the time, working on the lignite and making enough gas to burn the kiln. A kiln chamber holds 65,000 brick and requires two days for burning off, so you see one producer makes enough gas for 32,000 brick a day.

General View of Plant of Hebron Fire and Pressed Brick Co.

The Richardson Gas Kiln to Left, Flood Kilns to Right.

The plant is especially efficient in the matter of preparing the raw material. They have gone to a great deal of expense to install machinery for this part of the work. They grind and mix their clays and store same in bins. They make two kinds of brick, dry press and stiff mud, and is indicated by the name of the firm, the Hebron Fire and Pressed Brick Co. They make also a rough texture and a smooth brick and a hollow building block. From the clay bins the prepared material is passed through a disc feeder made by the Ceramic Supply & Construction Co., of Columbus, Ohio. It supplies a continuous stream of clay to the pug mill.

The last view should really come first. That is, it is a view of the clay bank. It is a remarkable deposit; there is about fifty feet fire clay, and beneath that lies the lignite which they mine and use as a fuel. The coal mine lies beyond the clay bank and is seen dimly in the distance in the accompanying view. In the foreground is a train of the company's cars loaded with coal. It is a great pity Mr. Richardson is not here to tell you more about the plant which is very interesting and peculiar in several respects.

Secretary Randall: This brings us down to the report of the Committee on Resolutions, of which Mr. Warren Griffiss, of Baltimore, is chairman.

President Salmen: As the resolutions are read, if any one desires to discuss same, they may do so, and we will take action on them after the report is read.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President and Gentlemen of the Convention:

Your Committee on Resolutions beg leave to submit the following report:

Whereas, The brick manufacturers of New York and vicinity have received the members of this convention with a spirit of instant and whole hearted cordiality and provided so generously for our entertainment and comfort;

Resolved, That this association extend to them its warmest thanks and deep-felt appreciation of their great hospitality.

Whereas, The mayor of New York has honored this association by an address of welcome through his able representative, Robert Adamson;

The Gas Producers.

Section of the Clay Bank, Coal Mine in the Background.

Resolved, That the thanks of this association be extended to Mayor Mitchell in appreciation of the courtesy shown us.

Whereas, The papers and addresses before this convention have been of such splendid character reflecting the deep thought and earnest care devoted to their preparation and must prove of great and lasting benefit to us all;

Resolved, That the most sincere thanks of this association be conveyed to the contributors for their unselfish work in our behalf.

Whereas, It was with a feeling of trepidation that New York city was selected as our place of meeting due to fear that its many attractions might interfere with the business of this convention;

Resolved, That the members are to be congratulated that these fears proved to be entirely groundless, the meetings of this convention being the largest attended and most enthusiastic held for years.

Whereas, The members of this association have been accorded every courtesy and attention at the McAlpin Hotel with exceptionally excellent service;

Resolved, That the appreciative thanks of this association be tendered the management.

Whereas, It has been God's will to take from our midst some of our members, namely: C. B. D. Howell, Chicago, Ill.; Andrew Harrington, Galesburg, Ill.; B. F. Walcott, Indianapolis, Ind.; Edwin Brockway, Brockway on Hudson, N. Y.; J. H. Mead, Warners, N. Y.; Harley H. Fate, Plymouth, Ohio; F. W. Bennett, Wellington, Ohio;

Resolved, That the deep sympathy of our entire membership be extended to their respective families and that a copy of these resolutions be forwarded to them.

Respectfully submitted,
WARREN GRIFFISS, Chairman, Baltimore, Md.
SIDNEY H. FRANCES, Fitchburg, Mass.
JOHN SCHUESLER, Buffalo, N. Y.,
W. S. GOODRICH, Epping, N. H.
IRVING A. RYTTENBURG, Sumter, S. C.,
JOHN P. CAHOON, Salt Lake City, Utah,
B. H. RICHARDS, Edwardsville, Ill.,
WM. BURGESS, Ontario, Canada,
E. J. SCHARIO, Louisville, Ohio,
Committee.

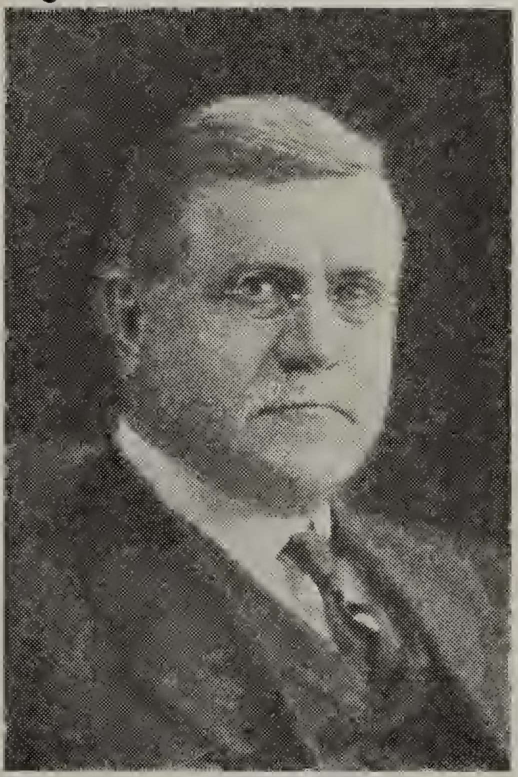
President Salmen: You have heard the report, gentlemen. What is your pleasure?

C. P. Mayer: I move the adoption of the report as a whole.

Elliott S. Morse, Wallingford, Conn.: I second the motion.

Carried.

Mr. Griffiss: I have one suggestion to offer, and that is that, if possible, the Committee on Resolutions be appointed earlier in the sessions, so they may have more time to get together.



Will P. Blair, Cleveland, Ohio.

President Salmen: I would say in that connection, of course, this year with only three sessions, it was difficult to give the Resolution Committee as much time as they should have had. I think Mr. Griffiss' suggestion is a good one and we will try next year to have the committee appointed at the first session.

Has anyone anything to offer at this time?

Mr. Hammond: Representing the New York hosts, so to speak, New York desires to say that it is amply repaid by your presence for anything New York has done. We have been very happy, indeed, to have you with us. We have been inspired to greater efforts in our business life; we have been inspired by the manner and methods of doing the same business by our friends from other states. We sincerely trust the meeting will prove beneficial to all, and we are desirous that you come again soon. (Applause.)

President Salmen: I do not think there is anything else, but I want to say in conclusion that I desire to thank the members of this Association for the uniform courtesy and kindness which they have shown me. I am a novice in this line of business, and I may have made mistakes, but you have generously overlooked them, and I am grateful. I now declare the thirty-first convention adjourned, subject to the call of the Executive Committee.

THE ANNUAL N. B. M. A. BANQUET

A DELIGHTFUL EVENING, A JOVIAL COMPANY, FINE MUSIC, AN EXCELLENT REPAST, AND ORATORY GALORE

IT WOULD BE DIFFICULT to imagine a more thoroughly enjoyable public occasion than the N. B. M. A. annual banquet, which was held in the beautiful ball room on the twenty-fourth floor of the McAlpin Hotel Thursday evening. A fine orchestra discoursed national airs and popular music and was supplemented by a jolly quartet and a lady soloist who scored a number of hits during the evening as did an expert accordionist, who was a whole orchestra in himself. The music, cigars and cigarettes were furnished by the local committee. The dinner itself was a triumph in culinary art and many of the guests remarked that they had never before seen so large a dinner party so well served. It was McAlpin service and it left a very pleasant impression with every guest. The toasts were exceptionally clever, but we will let the orators speak for themselves in the following complete report, though no printed page can do justice to the clever sayings of Herman Mueller or give more than a mere intimation of the genial good humor of Treasurer Sibley. The spoken word carries a much greater meaning and significance due to the personality of the speaker, but even so the report will be read with much pleasure by the absentees and with even more enjoyment on the part of those who heard the toasts.

MENU
Grape Fruit
Celery Consomme Olga Olives
Filet of Sole, Mornay
Emince of Sweetbreads, Trouville
Souffle of Corn au Paprika
Guinea Hen in Casserole Salad Dijonnaise
Bombe au Profiterolle Chocolate
Friandises Coffee

President Salmen: Ladies and Gentlemen—We have been feasting on good things. In fact, it has been a feast ever since we came to New York. One of the feasts that appealed to me especially was what we had last night at the smokerette. I hope, if I am privileged to attend another brickmakers' convention, we will have a smokerette, because we want the ladies with us. Now, for the rest of the evening, we are going to be in the care of Greater New York's greatest brickmaker, one who has joined our Association and one of whom we feel very proud, indeed. I have the pleasure to introduce as toastmaster Mr. William K. Hammond, of New York City. (Applause.)

Toastmaster Wm. K. Hammond: Ladies and Gentlemen—I feel signally honored by being in the position I find myself in tonight. You see standing before you a singularly embarrassed man. I tried to explain to the past master of jollying who prevailed upon me to accept this position that it really required somebody who knows how, and you will have found out before I get through that I don't know much about it. However, you are not here to listen to your toastmaster tonight. I can simply say, and I am glad to say it before we go any further, we have here tonight representatives from the Lakes to the Gulf, from the Atlantic, if not to the Pacific, to the far West, and we are all Americans in America, and each, I know, in his heart looks back to that time one hundred and forty years or more ago, when that body of brave men pledged themselves, their lives, their fortunes and their sacred honor to an ideal, and that ideal was life, liberty and the pursuit of happiness as the right of those who are born in America. (Loud applause.) To that proposition every patriotic man of that time resolutely gave his support. There were a few objectors, of course, there always are, and they tried to interfere with the development of the idea which has since been realized, the idea that our fathers desired, namely, that America should be the home of liberty.

Gentlemen—and ladies (I almost forgot the ladies)—and that reminds me of an embarrassing incident that came to me while on a trip to the Pacific coast a good many years ago. Mrs. Hammond accompanied me. We arrived at a big hotel one stormy night. I was told there were no rooms, but something about the clerk reassured me, so I took my pen and registered "Wm. K. Hammond, New York," and turned to the clerk with all the air of assurance I could summon. He said, "Are you alone, Mr. Hammond?" and with no little embarrassment I added, "and wife," to the register. (Laughter.) I was embarrassed, but not so much so a friend of mine a good many years ago, who lived on a farm in New Jersey. He used to drive into town to dispose of his stuff. He had a good horse and wagon, and his wife would accompany him when he would let her, which was about four or five times a year. On this particular occasion she accompanied him, and when they got to town, left him to do some shopping. When he got through with his own affairs, he started back home, crossed the ferry comfortably, carrying his load well. (Laughter.) When he reached home one of the boys came out and said, "Where's mother?" "Well," the old man said, "I knew I had forgotten something."

I trust I will not forget anything tonight. If you will help me, I will do my best. As the first toast, I will ask every one to rise and silently toast the President of the United States. (Applause.)

I find on referring to the program of toasts that under the name of toastmaster it says,

"One feast, one house, one mutual happiness."

That is delightful, and if all of you who are here will just hold to that motto, and take it from your toastmaster, that is the course to follow.

We have, as the first speaker of the evening, the Honorable James E. Watson, of Washington, D. C. The secretary has received from him his regrets in the way of a special delivery letter, and if he will be good enough to read it it will explain his absence tonight.

Regrets From Hon. James E. Watson.

Secretary Randall: Mr. Toastmaster, Ladies and Gentlemen—For two months or more I have hugged to my bosom the fond idea that at last, after several years of waiting, I was going to have the great pleasure of introducing to you my friend, James E. Watson, U. S. Senator from Indiana, a Hoosier orator whom I dearly love, a man of charming personality. He is a fine orator, one of the finest in this country, but he is unable to be here, the affairs of State compelling him to remain in Washington. I will read his letter.

United States Senate, Committee on Commerce.
March 8, 1917.

Mr. Theodore A. Randall,
Room 1220, McAlpin Hotel, New York City:

My Good Friend—I very greatly regret my inability to be with you tomorrow evening. We are in a death grip here over the rules of the Senate and other matters of vast national interest, and I cannot possibly leave without doing myself a very great injustice.

You will never know how keenly I regret my inability to be present. You have been so exceedingly kind to me at all times that I am loathe to decline to attend your banquet, even though I subject myself to censure, both here and at home. However, I know that your dinner will be a great success without me, and that my presence will not be necessary in order to promote the purpose of your coming together.

I know that you will thoroughly understand the situation in which I am thrust at this exceedingly delicate and trying time, and that you will feel more like sympathizing with me than abusing me.

31st Annual Convention and Banquet
National Brick Manufacturer's Association
of the United States of America
Hotel McAlpin New York. March 8.1917.
Drucker & Co
NY
17 306

FLASH LIGHT PHOTOGRAPH OF THE ANNUAL BANQUET OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION
McALPIN HOTEL, NEW YORK CITY, MARCH 8TH, 1917

Please give my sincere good wishes to Will Barr and reserve a little for yourself,

Fraternally yours,
JAMES E. WATSON.

I shall hope that the years will continue to deal lightly with us all, and that at a subsequent time I shall have the very great pleasure of introducing my friend, "Jim" Watson, to you.

Toastmaster Hammond: The next toast is "Happiness, the Hidden Soul of Harmony." If there is any subject for human beings to devote themselves to especially, it should be the one of harmony. It is in vain, however, for me to hold forth upon this subject, when we have an orator here in the person of Mr. Herman Mueller, of Trenton, N. J., who has made a lifetime study of it and will tell you a little about it in the next hour or two. (Applause.)

"HAPPINESS"

"The Hidden Soul of Harmony."

HERMAN C. MUELLER, TRENTON, N. J.

Mr. Toastmaster, Ladies and Gentlemen:

You are very kind in calling upon me. I appreciate it, because I would rather make an after-dinner speech than any other oratorical effort, because nobody takes you seriously and a man can talk the greatest kind of nonsense and is sure of a most generous applause. With this, however, I wish to have it understood that I do not mean to cast sarcastic reflections upon the learned gentlemen who have had the honor to speak before me. I am without guile, an innocent poor stick-in-the-mud clayworker, who has been trained in patience and who has imbibed the milk of human kindness which flows through our industry, for many years.

I would like to talk about something real pleasant. There are some ladies here. Well, I wish I could master my constitutional shyness to talk about them. Not that I haven't tried very hard to get acquainted with this charming subject. I have honestly tried from my earliest youth to get next to it.

So let us talk about something which we try to find in company with the ladies. Let us talk a little about Happiness. What constitutes happiness? The usual answer is: *To get what we want.* This sounds good, but is it true? I know it is not. How do we know it? How can we be sure of it? Some man thinks money will make him happy. After he has it, is he? I know a good many rich men who strove hard after money, and when they had it, they pulled a sour face and wished they were still poor and contented with corned beef and cabbage. Some one thinks he must get a certain blue-eyed blonde beauty or he would forever be miserable. It has happened that such hunters of Nirvana has the most horrible tales to tell in the divorce court. I think happiness has but little to do with possession, though it often helps.

I will tell you a few stories to illustrate my point.

There was a king who loved his people and who wanted his people to love him. So he wanted the people to rejoice with him whenever he felt real happy, and he had a bell put on the roof of his palace which he wanted to toll whenever he was happy. The cord of this bell was extended to his table, so it was handy for him to ring the bell. Now, this story which belongs to the folk lore of the Vaterland, does not end very happily. The poor king became very old, but the bell was silent during his long reign. The people who loved the king eagerly listened, but finally made up their mind that the king was indeed very miserable. Only in his dying hour, when he saw his people peaceful and satisfied, when he saw his children with the light of love around him, when he received the greetings of the kings and nations of his neighborhood, then swelled his heart, he reached for the rope, but—too late—Death had overcome him before he could pull the bell.

It was very likely his own fault. He may have been a pessimist, one of these unfortunate fellows who are never satisfied, or he was a coward, because it takes courage to be happy, to not let the pin pricks and body blows, which this life brings with it, to interfere with our humor. Many a man walks around with his nose to the ground and a frown on his face and a sign and a hard luck story for each man he meets, when he really has no real reason for it; and, on the other hand, another man has a hearty cheery greeting for his fellow men, brings sunshine into every dark corner, when he perhaps has a great deal of trouble and sorrow. And here I will tell you another story which I myself experienced.

Some years ago I waited for an architect in his office—in Bridgeport, Conn. His assistant entertained me while I waited. This assistant was a poor little cripple, twenty-five years old, a hunchback with the body of a boy of ten. He told me how his father died, leaving his mother with six children, he then the oldest, fourteen years of age; how he sold newspapers, shined shoes, done odd jobs, etc.; how some one gave him a chance to study drawing at the Y. M. C. A. evening courses; how he got a job afterwards in an architect's office, receiving first six dollars, afterwards ten, twelve and fifteen dollars a week; how he saved to take a course of architecture at Columbia College. He told me this with shining eyes and wound up by saying, "I tell you, I am the luckiest fellow in the world, because everything comes out all right."

I looked at the poor little cripple and I got a lump in my throat and I thought, "You are not a little insignificant caricature of a man. You are a Knight in Golden Armor, and you have the heart of a lion."

And so, ladies and gentlemen, we must come to the conclusion that happiness is not thrust upon us; it does not come from the outside, but the inside of us.

Allow me to wind up with another example by telling you the story of *"My friend, the billionaire."*

Some years ago I had to spend a few weeks in New York. I looked for congenial company, and, like other benighted sinners, went into a winehouse. Looking around, I found a little old man sitting at a table by himself. He was very old, with a white beard, and his clothes were well worn. His face was wrinkled and furrowed, but his eyes looked bright and friendly into the world. He sipped his wine like a conniosseur, and when he paid for it, I noticed that he fished his dime with some difficulty out of his pocket, so I naturally concluded that he was but meagerly equipped with the treasures of this world. I mustered up courage enough to invite him to a glass of wine, which he gracefully accepted.

Herman Mueller, Trenton, N. J.

And so we talked about everything and I fell in love with the old fellow, with his quaint and matured philosophy and his benevolent attitude. He finally invited me to visit him and I went to see him the next Sunday. He lived in a small shack back of the Palisades, all alone with an old friendly dog. This was not the only visit I paid the old man. I bought him a few things to cheer him up—a bottle of wine, a package of tobacco, etc.—and he accepted these little presents without embarrassment.

One holiday I made up my mind to give my friend a good time and asked him to have a day with me. We went on the trolley to the ferry, crossed over, went to Central Park, which we thoroughly explored, then to the Metropolitan Museum of Art, to the Zoo and wound up at the restaurant where we had a substantial meal.

The old man was as happy as a lark and I enjoyed myself hugely.

When we had satisfied our stomachs we leaned back and went over our experiences, with a good cigar and an additional bottle of wine. All at once I noticed that the old man chuckled to himself; that he evidently thought of something funny. I asked him to let me in on the joke, and he said: "Well, I suppose I'll have to tell you, though it may spoil your fun. You, my young friend, are evidently laboring under the idea that I am a very poor man. Well, I accepted your well meant presents gladly, so as not to embarrass or disappoint you, but I am really a very rich man. Did you notice how polite those motormen on the trolley were when they saw me? I am the owner of the road. Did you notice how the captain of the ferry boat shook hands with me? I own it, and this park, this museum, these animals—I own it all."

I, of course, thought he was either crazy or effected by the wine, and when I showed my perplexity in my face, the old man burst out in a great guffaw. "Now," he said; "now, you think I am crazy. But, my friend, could I enjoy all these accommodations, these flowers and trees, these pictures and statues, these animals and what other is of interest in this world more than I do, *if I had the deed for all of it in my pocket?"*

This is the story of my friend, the billionaire.

And so, we again see that happiness is born within us; is not at all depending upon outside conditions or influences. (Applause.)

Toastmaster Hammond: After listening to Mr. Mueller, I want to say I think I have made a pretty good start tonight on the way to Mr. Mueller's philosophy, and I trust by the time I grow up, if I can associate with him for the next thirty or forty years, that I may absorb some of it. Now, I desire to present to you one who will speak to you on the subject, "Common Clay," and while he is not the one whose name is given on our program, I believe he will give us an impressive message, and beneath his toast I find this sentiment: "He's true to God who's true to man." The Reverend James E. Wasson, of New York City, will speak to us on this topic, and I trust he will speak as long as he wants to. (Applause.)

COMMON CLAY.

"He's True to God Who's True to Man."

REVEREND JAMES E. WASSON, NEW YORK CITY.

Mr. Toastmaster, Ladies and Gentlemen:

You will not find my name on the program, because I am a filler in, and you will have to take the consequences. I was quietly engaged in discussing my Emince of Sweetbreads, Souffle of Corn, etc., and feeling happy and at peace with all the world, when my dear friend, Mr. Randall, came to me and whispered that I must speak this evening, and after some hesitation I consented, because I like Mr. Randall and like to do what he asks me to do, to make a few remarks, although I think my address will prove to you the need of preparedness.

I cannot refrain from telling a little story in which my good wife participated, because we employ teamwork in all our stories and our jokes. I was telling her the other day that our friend, Mr. William Jennings Bryan, had remarked a few months ago that if there were need of it one million men would spring to arms before sunset. Whereupon my wife said, "Well, to whose arms will they spring; their wives' or their sweethearts'?" (Laughter.)

So tonight I have come to you unprepared to speak, nevertheless, in accord with such a joyous occasion as this I must confess it is a pleasure to me to speak to you, to say nothing about whether it is a pleasure to you to listen or not. I am, perhaps, not going to be as successful as the young man I heard of some time ago, who went to call upon his girl. At least, she was not his girl yet, but he had strong hopes that she would be, and she had equally strong hopes herself that she would be some time. In the course of his call, he did the usual thing that young lovers do—he kissed her, whereupon she said in veiled protest, "You have no business to kiss me;" and he replied, "It wasn't business; it was pleasure," and he looked the part.

We are at an age when business is coming to the front. It is business today which is the great concern of the world, and around the great factors of business all the other great issues of life and death seem to center. The business in which you are engaged is in the truest sense of the word a work of upbuilding. You are upbuilding in no small measure, and the great work of building of our material civilization, and I am sure also you are helping to upbuild our spiritual and our moral civilization as well, because all these things go together. I wish I were more familiar with the great business in which you are engaged, because it would enable me to make a few pertinent remarks which might interest you. But I know very little about brickmaking. Not even as much as the inebriated individual who was causing a disturbance on the street, and was taken in charge by a policeman. When the policeman was taking him to the station house, the man kept saying, "I am a brick," "I am a brick," and finally the policeman said, "That's all right, bo, don't let that bother you. I was a bricklayer before I was on the force, and I will take care of you." (Laughter.)

I do not know much about the industry of brickmaking and, therefore, I cannot speak to you about that; and I don't think it is necessary to tell out-of-town people like yourselves much about the great city of New York, because I have found in all my experience of many years that as a rule our visitors to the great city of New York, within two weeks, know more about the city in all its different aspects than all of our citizens who have lived here for many years, so I am reminded that you, ladies and gentlemen, know as much about New York as I do. I was travelling in South Dakota last fall, and I noticed in that sparsely settled state that the people there were quite as familiar with the fashions and the other interesting things which we regard as pre-eminently pertinent to New York. We noticed, for instance, that the women's dresses were about as low and about as high as they are in New York. They observed the high low and the low high. (Laughter.) So I cannot speak much to you about the city of New York. I am reminded of the story of the man who was walking along the street in a small town and met the ministers' son, and said, "Johnny, what does your father do when he is in the pulpit and don't know what to say?" "Oh," said Johnny, "that's easy; he just pounds the pulpit and hollers," thus making noise take the place of eloquence, and ofttimes some people like noise. The toastmaster on an occasion like this one has a very important duty to perform. I was talking one day with a gentleman who is very often called upon to officiate in the capacity of toastmaster, and I said to him, "What is the most important duty you have to perform?" "Why," he said, "the most important duty I have to perform is to wake up the audience after the speaker gets through." This is certainly a very important duty.

I had not intended to take any special subject when your secretary asked me to speak. He asked me what I would speak about, and I said, after a moment's hesitation, "I think I will speak about ten minutes." I think that is about the limit for a man who is not prepared to inflict himself upon an audience. I heard a story recently of a man who was in a little country town and when he got to church the minister was preaching. The man slipped into a pew near the door, and finally he leaned over to his neighbor and whispered, "How long has he been preaching?" and the man who was a little deaf, and did not exactly understand what the other fellow meant, said, "He has been preaching about twenty years." "Great Scott!" said the late comer; "hasn't he got through yet?" (Laughter.) I do not think I will speak so long as that.

I want to close by saying that I am well pleased and very much honored to have been asked to come and join with you and enjoy this very pleasant feast, and also the feast of eloquence. I came to you to give the opening invocation the other afternoon as an entire stranger to all of you, but I felt tonight as though I am no longer a stranger, but a friend, and I hope I may have the pleasure in the future of meeting some of you again in the bonds of good fellowship and friendship. I thank you. (Applause.)

Toastmaster Hammond: It has been considered very reprehensible, but now we have it on divine authority, that it is in good form to observe the high low and the low high. (Applause.) And I am for it, and so say we all of us. Now, we have a surprise for you. Whenever we hear the name, Birmingham, Ala., we know it stands for something doing. They make things there, and it takes men to turn them out. One of the men who does things there and elsewhere, too, is here with us tonight, and I am pleased to present to you, in the place of Fire Commissioner Robert Adamson, who was to have addressed us on "The World on Fire," Mr. John W. Sibley, who is no stranger to you. (Applause.)

ADDRESS OF JOHN W. SIBLEY.

Mr. Toastmaster, Ladies and Gentlemen:

Mr. Randall did not give me as much latitude as he gave our ministerial friend as to time or subject, but informed me that I would have to fill the place of the fire protection man, and I feel much in the same box I was in sometime ago, when called upon to address a boys' industrial school at Birmingham. I was nonplused as to what to say, so I said, "Boys, what shall I do? Make a speech or offer prayer?" and one red-headed, freckle-faced rascal in the first row said, "Mister, make a speech," so I started out, and when I had got pretty well along, this same little rascal got up and in the most solemn manner, with his hands folded in front of him, said, "Let us pray." (Laughter.)

Coming from a territory that is mighty soon to be affected by the bone dry law, I may be excused for giving the same excuse that a certain brickmaker I heard of gave on one occasion. He had attended a banquet and when he got home he said to his wife, trying to give her some reason for his befuddled condition, "My dear, I got more whiskey than I wanted and that is why I am in this fix." His wife said, "Well, when you got all the whiskey you wanted, why did you not take sarsaparilla?" "Why, my dear," he replied, "when I got all the whiskey I wanted, I couldn't say sars—sarsperiller." (Laughter.)

That reminds me of a story told on our good friend Randall. He had been attending a certain meeting of the Shrine and told his wife that after the chief business of the meeting was over, the Potentate got up and said, "I am going to present a silk hat to any member of the Shrine who will stand up here and tell truthfully that he had never kissed any other woman than his wife since he had been married," and "Do you know my dear, not a single man stood up." His wife said, "Why Teddy, I am surprised, why didn't you stand up?" "Well," said Teddy, "I was going to, and then I thought I would look like hell in a silk hat." (Laughter.)

Now he was about as badly mixed as the fellow who was asked to respond to a toast to the ladies. He thought he would indulge in a little poetry as befitted the theme, and he said:

> "Oh woman! in our hours of ease,
> Uncertain, coy, and hard to please,"

He hesitated a moment, and then went on.

> "Yet seen too often, familiar with her face,
> We first endure, then pity, then embrace."

(Laughter.)

The subject that was assigned to the man whose place I am filling is "The World on Fire." "An ounce of prevention is worth a pound of cure." The story is told of an old darkey and that Death came around and notified him that he was going to call for him and transport him to glory or the "world on fire," on the following Saturday night. The old darkey talked it over with his wife, and he said, "We have got to fix this up some way to get round that proposition." So they concocted a scheme, and when Saturday night came round, Death came, as he had said he would, and knocked at the door and said, "Is Tom Jones here?" The wife said, "No, Boss, he has gone out visiting." Death said, "If he has gone, I will have to take his wife," and the old lady said, "Look here, nigger, you come out from under that bed." (Laughter.)

I am afraid that is the way some folks are going to feel who are trying to put up some so-called fireproof material and call it as good as burned clay. We know that burned clay is the only thing that will stand the test of fire, and when Gabriel blows his horn you had better be in a fireproof building.

I might keep on and tell some of these ancient jokes, or as Mr. Mueller said, I might try to paint a picture of the fair State from which I hail, but I am sure that I would be in the same state of excitement and feeling as another darkey who went down to a revival meeting and got very much enthused and came back and said, "We sure had a grand meeting down there. The preacher's text was from the Prodigal Son. He talked about the fatted calf, and he went on and told about the effects of sin, and about sinful women, and the high low and the low high, and said, 'I tell you, brethren, hell is going to be full of women wearing short skirts and low neck dresses and peek-a-boo waists.' A fellow who was listening to him said, 'You, Jim, that's no way to be talking to a man who is trying to keep from going to hell.'" (Laughter.)

I am reminded that the hour is growing late and I do not want to trespass upon the time of some of the other speakers who are prepared and have something interesting to say and, if you will pardon me, I will make a change from the ridiculous to the sublime and tell you of a beautiful allegory I heard told by our famous southern evangelist, Sam Jones.

An angel made a visit from heaven to earth and saw a great many interesting and beautiful things on earth and as evening was drawing to a close, he thought he would take back some memento of his visit to earth. He was passing along and saw a beautiful garden where some roses were blooming and he said to himself, "Surely that is the loveliest sight in the world." So he plucked a rose or two and put it in his garment. Going a little farther he saw a baby's smile and he said, "Surely that is the loveliest thing in the world." So he gathered the baby's smile and placed it tenderly in his robes. And then he looked up and saw the mother looking down on her babe and smiled and he said, "Surely that is the loveliest thing in the world." And he gathered that up and folded it tenderly in his robes and wended his way to the pearly gates. When he got there he thought he would show these treasures that he had brought from earth. The rose was all wilted and the babe's smile had faded away, but the mother's love was just as beautiful and pure as when it left the earth. And he turned around and called to all the hosts of heaven and said, "Come and see, the only thing in the world that will last from earth to heaven is mother's love." (Applause.)

Toastmaster Hammond: I knew we were making no mistake in pressing Mr. Sibley into service. Massachusetts contains within her borders the hub and other good things. We have with us tonight a man from Massachusetts who will speak to us on "The Son of Adam," "Come, let us put our heads together and make a block pavement." It is a pleasure to introduce Mr. Ross C. Purdy, Worcester, Mass. (Applause.)

TECHNICAL EDUCATION.

ROSS C. PURDY, WORCESTER, MASS.

Mr. Toastmaster, Ladies and Gentlemen:

It is indeed a pleasure to address such a splendid audience as this. I was somewhat embarrassed when I found myself seated here next to the minister's wife, but the thought occurred to me that being a minister's son myself, I would not be here if it had not been for a minister's wife, and so I proceeded to enjoy myself. My toast, as it appears on the program, may lead you to think that I am going to talk to you in a humorous vein, but I am not. Instead, I am going to talk to you seriously for a while on the subject, "Technical Education," and though serious, it is a subject of deep interest to all who have the welfare of the clay industries at heart.

My subject sounds dry. It is dry—bone dry. I selected it myself and asked to be put upon the program. I know that my motive is going to be misunderstood by some of you, for some of you, as did Norah, the colored cook, are sure to misunderstand the purport of my words. "Norah" said her mistress severely, "if you have that policeman in the kitchen again I shall speak to him." "Go as far as ye like mum," said Norah, "but yez'll niver git him. We're to be married next Chuesday."

I have no axes to grind and I hold no briefs. I am going to fearlessly give you my observations on technical education as viewed from actual experience as an instructor and as an employer of graduates from our ceramic schools.

I am confident that most of you are going to understand me. I am not as conceited as the author who, when hotly discussing the merits of a book with a merchant finally said, "No, John, you can't appreciate it, you never wrote a book yourself." "No," retorted John, "and I never laid an egg, but I'm a better judge of an omelet than any hen in the state." I know you will appreciate what I am going to tell you for I am going to talk *at* your heads and not *over* them.

Ross C. Purdy, Worcester, Mass.

You have hired graduates of our ceramic schools and know very well your experiences with them. I am making bold, however, to draw your attention, as well as those who are instructors, and those of you who are parents to some of your blockhead errors. I believe I am quite far from being an iconoclast in this, so please temper your judgment.

My text is:

Let's put our heads together and have a block pavement.

This was said by the ward boss of a German settlement in Cleveland at a mass meeting in protest against the condition of their streets. It is exceedingly applicable to the subject on which I am going to speak this evening.

The first blockhead idea concerning technical education to which I wish to draw your attention is the idea that it will make an expert of whoever takes a technical course in college.

The second blockhead notion is that a man differs from the boy that he was other than having more tools in his head.

There is no question at all of the special advantages of a technical education when that education is in accord with the natural talents of the individual. My observation, however, is that the education received by the majority of college graduates is about as useful a tool to them as a set of carpenter tools would be to an armless man, or a pair of skates to a legless man. You might as well give a tongue-tied, hair-lipped young man a training in public speaking as an engineering education in ceramics or any other line of engineering to the majority of the graduates of our engineering schools. Technical education, that is, a knowledge of the fundamental sciences and their application, and a knowledge of ways and means of accomplishing engineering tasks is an absolute necessity to a good resourceful engineer and no one would question the statement that this education is best obtained in a college. A college course of education is progressive in its sequence of subjects studied and is designed to give as much breadth as the time will allow. It is a systematic course of mental training, methods of thinking, of analysis, and above all, it is a symmerical acquisition of the fundamental knowledge that an engineer must have. *To give shape to* and *to strengthen one's ability* to correctly analyze a case or a situation, and to know where he can find facts and tried practices that apply, are the chief aims of a technical education. Mind you, I said *to give shape to* and *to strengthen one's ability* along these lines. I did not say to create that ability.

You can't make paving brick out of any old clay. You have to first find a clay that has the right stuff in it and then treat it *right*, but the university is compelled to take any raw material that comes to it in the form of freshmen, good, bad and indifferent. No matter how much care is exercised in shaping this material into the finished product the result is good, bad and indifferent technical men.

Before enlarging further on the idea that a technical education cannot make an expert nor create talent, let me emphasize that it is most important to the success of a practicing engineer that he has marked ability as a human engineer. By human engineering, I mean the science of man management. I probably feel more keenly the importance of ability in human engineering than most others because I have had personal reasons for studying this subject.

By human engineering, I mean ability to keep in tune with your fellows; with those who are your superiors and those who are your inferiors in rank, and also those with whom you deal in a social and business way. Human engineering involves more than mere keeping in tune with your fellows. It involves the knack of keeping *them* in tune with you; it means the enlisting of their full co-operation, the sharing with you of their knowledge, and securing their help to solve your problems and to achieve your aims.

This human engineering cannot be taught in the class room and is not to be picked up by loafing on the campus without purpose. A recluse, whether he is a recluse in an actual physical sense or a recluse mentally, will never learn the first or fundamental principles of human engineering. It is to be learned only by constant effort for recognition and acceptance by your fellows as one worthy of position, trust and, above all, their personal fellowship. God-given personal magnetism, experienced-given tact, and ambition, backed by ability to do well the things assigned to, or assumed by you, are the factors of success in human engineering and these necessary factors of success in human engineering are of importance in the order given, that is, personal magnetism, tact, ambition and talent. It is only this last factor, that of talent, which is developed into ability in the class room.

When I say, therefore, that it is a blockhead idea to expect, that technical education will make an expert of every graduate, I refer most largely to the least of the requisites for success as an engineer, that of technical ability. I know men who are very able technically, who have superior ability as technical discoverers, who fail miserably in human engineering. Such cripples can not be engineers and must be content with pure research work. Such as these are rare birds. They are freakish creations, born with ability to achieve in investigations whether they are schooled in a class room or self-taught. Such extreme scientific ability is denied most men and cannot be acquired, do whatever man will. The class room exercises can only train such talent as is latent in the student.

There are, however, varying degrees of this latent talent ranging from the maximum down to zero and there are many who succeed in meeting all the requirements for a collegiate degree whose latent technical ability is well nigh zero. When the student is wanting in personal magnetism and tact and has but a small amount of latent talent, the graduate is certain to be a flat failure as an engineer, and much more so as an investigator.

I well remember the doctor of philosophy who had been given several college degrees in this country and in Germany and who boasted that he had studied all branches of chemistry, but who was a miserable failure as an analyst and as a teacher. I was one of his pupils—a sad misfortune for him. He died shortly afterwards.

A book worm generally has a lot in him, but that lot usually, although not always, is vacant and grown rank with weeds. Time has not been given to keep the lot cultivated nor trimmed.

The book worm, such as this instructor of mine, who although he had earned many degrees in universities, lacked what the boy did of whom James' mother told when James started for his third helping of pudding.

"Once upon a time, James," admonished his mother, "there was a little boy who ate too much pudding and he burst."

"Tain't any such thing as too much pudding."

"There must be—didn't the boy burst?"

James passed his plate for the fourth helping saying, "Not enough boy."

"To have a thing is nothing if you've not the chance to show it, and to know a thing is nothing unless others know you know it." This requires all of the essentials of successful human engineering.

I would say that a very large proportion of the graduates of our engineering colleges (and for that matter, all kinds of colleges) are deficient in ability, that is, they have not sufficient ability to meet the business and industrial requirements in their chosen lines. The attempt to give these men even the first essentials of ability is as futile as trying to make a purse out of a sow's ear; to make a carpenter of an armless man, or an orator of a man whose tongue is cleaved and upper lip split.

To expect every graduate to have ability in his chosen line is as ridiculous as to expect to make a musician of every one who studied music. The human organism, that is, the brain, nerves, muscle and all must be adapted, and when not adapted they cannot respond to the most thorough of training courses.

Universities are not *alone* responsible for the technical ability of their graduates. They cannot prevent men lacking in latent talent coming to them and they cannot prevent them obtaining degrees. All that can be expected of a university is to offer the best course of training to all who will avail themselves of the opportunity, to have standard requirements for graduation and graduate all who succeed in meeting these requirements. Nothing more should, nor can be expected of a university. It is a case of rank blockheadedness, however, when a university recommends graduates who through want of personal magnetism, tact or inborn talent cannot meet the requirement of a given industrial opportunity.

I would not relieve the university of all responsibilities, for with the best course of training, the finest buildings and the most complete equipment, it is altogether up to the instructors to develop such talent as is latent in the students. A poorly housed and poorly equipped college with instructors who can train the students to think systematically, from known facts to new discoveries, is, by far, more able to develop technical ability in their pupils than an elaborate outfit of buildings and equipment manned by men who cannot train their pupils to think logically. When I hear of a university asking for a three million appropriation for buildings my thought invariably is, will they pick instructors who can teach their pupils to think?

A mere memorizing and recitation of facts is not acquisition and use of knowledge, and much less is it a development of technical ability. It certainly does not train one to think. Students in laboratory courses should be compelled to get their own facts and to correlate those facts and to justify their own observations and conclusions with the facts and with the observations and conclusions made by others. A student, especially in a laboratory, should work out and conclude his investigations under the same sort of conditions he will meet with in industrial practice. The instructor's part should most largely be that of a pace-maker. He should start and work to the end with the students through each problem and he should not give them, aside from leadership, any more aid than they could receive from one another. This puts the boys onto their own feet and teaches them to walk unassisted. Too much assistance will deform a student's thinking organ just as surely as the constant use of a crutch will deform his back and limbs.

One of the blockhead mistakes often made by our universities is to judge instructors of applied science by their research ability. To value an instructor by his research ability alone is absolutely a blockhead stunt. In saying this, I do not intend to have you underestimate research work, for I think *it is of the utmost importance*. I hailed with expressed pleasure the announcement that one of our universities had established a research professorship, the professor to devote his entire university time to research and not any to instruction. I am fully convinced that every instructor in applied sciences should be engaged in some research problem. However, what I wish to establish is that research ability alone is a darn poor basis on which to judge and employ instructors.

Another evidence of blockheadedness on the part of universities is their attitude toward commercial connection of instructors while in the employ of the university. It is just as ridiculous. Yes! just as downright foolish to prohibit the instructors from accepting a contract with an industrial concern for financial profit as it is for a university to allow unlimited privileges in this respect. We have these two extremes in this country in universities having ceramic departments. Both are doing actual injury to the value of their instructional work, the one by neglect on the part of the instructors of industrial needs, and the other by neglect of their pupils. I do not know which is the worst. The president of the university where retainers are prohibited told me that he knew it meant that the instructor would not do consulting work if the university took the fees paid, and I know from personal experience with the graduates that the students are neglected where their instructors have unlimited privileges to accept retainers. Both of these extremes are wrong in that they deprive the student of the benefit of the instructor's industrial experience. A limited privilege in the matter of profitable retainers is advisable.

The instructor who is not permitted or is not encouraged to do commercial work will be placed in as embarrassing a position as the teacher who asked Harold how many of eleven sheep would be left in a field if six jumped the fence. "None," replied Harold. "Why yes there would," said the teacher. "No, sir," persisted Harold, "you may know arithmetic, but you don't know sheep."

An instructor, unacquainted with industrial requirements, is very apt to raise in the minds of his pupils a question of doubt as to his knowledge as did the teacher who told the school the story of the Roman who swam across the Tiber three times before breakfast. "Three times," involuntarily said the wondering Jimmy. "Did you say three times, Miss Mary?" "Why yes, Jimmy," responded the teacher, "you don't doubt but that a trained swimmer could do it, do you?" "No ma'am," was the smiling reply of Jimmy, "I just wondered why he didn't make it four and get back to the side where he left his clothes." The instructor must know by actual experience the practical setting of each problem.

You see, we are all blockheads, the university presidents, instructors and the employers of the graduates.

There is one more example of blockheadedness that I will merely hint at, and that is the forgetting that men are mere boys grown tall and heavy bodied, with but a few more tools in his head. A man is a boy with training and experience but a boy still. It is a case of blockheadedness when we fail to give a man the same sort of—but perhaps not so fully—the same sort of license to errors of judgment and flights of indulgence in personal desires as we do boys.

Alfred Pettit, Chairman Ladies Entertainment Committee, New York City.

If before judging a young graduate, employers would review their own thoughts, actions and deeds during the same period of time in which a given employe has been under observation, it would be a rare case where the employer would not have to admit that his sins of omission and his sins of commission do not differ in numbers from those of the employe and that the real differences between the sins of the employer and the young graduate can be shown to differ only by such factors as experience, responsibility, and so forth.

I have hastily reviewed the blockheadedness met with in preparing students for the profession of ceramic engineering. We have found this in the parent's mistaken idea of their son's fitness for the profession. We have found blockheadedness in the idea that all who take a collegiate training in ceramic engineering, are ceramic engineers. We have noted blockheadedness in a case of instructors and also in university authorities. We have found blockheadedness in the false, if not impossible, standard by which the employers often, altogether too often, judge the young graduates. We all are guilty of blockheaded stunts, so please *expect* the inexperienced graduate to do blockheaded stunts.

Let's put our heads together and have a block pavement. (Applause.)

Toastmaster Hammond: We are getting along nicely now. I desire to tell a story myself. I have been listening to these orators get a lot of applause for telling stories, and while I will not say I have heard all their stories, before I introduce the next speaker, I want to tell a story. A darkey parson was holding forth as only darkey parsons can hold forth, and you all know how that can be done if you have given yourselves the opportunity of listening to one of them. He was preaching on creation, and telling how man was made, and he said, "The Old Master jes' stooped over an' he grab up a little bit of dirt, an' then he grab up a little bit of clay, and then he went over to the brook and got some water an' he wet that clay an' molded it and shape it up 'til he got in it the shape of a man, an' then he stood it up against a fence to dry." Just then a darkey in the audience said, "Parson, if that was the first man, who made that fence?" The parson said, "Shut up, nigger; a few questions like that will destroy all the theology of the world." Laughter.) The next topic on the program is "Brick Musing," and the gentleman who will respond to same is a New Yorker, much honored and respected, sound and square as a brick. He deals in brick and his name is H. D. Lounsbury. (Applause.)

BRICK MUSINGS.

HERBERT D. LOUNSBURY, NEW YORK, N. Y.

Mr. Toastmaster, Ladies and Gentlemen:

If I am to finish my speech on the same day it is begun, I must hurry for the witching hour of midnight will soon be here.

I congratulate myself on being here and in this presence, and I congratulate New York on its visitors than whom, none have contributed so much to produce the beautiful and indestructible city, in which, Mr. Hammond and I only live, but to which, you are privileged to come. A gallery is more interesting to visitors than to the attendants in charge. It is not so pleasant to make a trip from New York to the west, as from the west to New York because on the latter journey you see more people on the train.

Youth is transitory but success everlasting. The National Brick Makers' Association cannot boast of extreme youth but may congratulate itself on being thirty-one years old, still alive and growing to mature stature.

Nowhere do such strange things happen as in this world, and the strangest of the strange is to see this association, after a generation of existence, condescend to pay belated homage to the city of New York. I understand why some of the face brick manufacturers hesitated so long coming to New York, fearing to stand face to face with the bricks they have shipped here.

At a convention held in Chicago a few years since, a member of the brick profession taunted his fellow manufacturers with the alarming statement that not one millionaire could be found in the brick business. Relying on the accuracy of that charge, I hasten to explain the reason, that casting aside greed of gain the brick manufacturer has placed the man above the dollar and consecrated his life to public service. If the steel and coal men would do likewise, Billy Sunday's pending campaign would lose some of its possibilities.

Last December I attended a brick convention at French Lick, more exclusive than this. There we tolerated only those who made and sold face brick. This convention is more democratic and you have observed, almost daily, "face" brick men speaking to "common" brick men, proving there really is no caste in America. The only difference between "common" brick men and "face" brick men, is one stands for quality and the other for quantity. The common brick man tries to see how many bricks he can sell for the least money and the face brick man how good a brick he can furnish for the least money, with the same result in both cases. It is sad to relate that about the only time the two classes of brick men speak to each other, is at these conventions where we all come to air our grievances but never correct them.

In my opinion, the great crisis occurred in the face brick business about twelve years ago. I was sitting in my office one bright, beautiful day talking with a manufacturer. The sun was warm and effulgent, the sky blue and cloudless, the orders were coming in generously and at fair prices. Amid that scene of commercial tranquility I invited one of our salesmen in the room to ask his opinion of conditions. He entered and exploded a bomb that was heard around the brick world. He said, "Mr. Lounsbury, I observe on every hand a growing demand for a better brick at a lower price." My friend and I sat there with blanched faces. Suppose that message of ill-omen should leak out? It must be suppressed. But in some way there was a "leak" and it got out, and from that time up to the present minute, it does seem as though the life of the brick manufacturer has been devoted to meeting that demand—better bricks at lower prices.

Dawn is beginning to break and if the manufacturer will adopt the open price system, approved by the French Lick convention and then make their agents demand a reasonable, living price at the consuming end, the better bricks you are making will net you, and us all, better prices.

In the divine economy, the cotton plant grows in one part of the world and indigo in another. Olives are indigenous to one continent and potatoes to another. But civilization is never content with what is nearby, it is always longing for the remote.

Thirty years ago nearly every building was faced either with

Trenton red brick or brown stone—a "brown stone front" was a trite and proverbial phrase indicating the abode of wealth and fashion.

But the demand for the new and remote was irresistible and soon the brick and stone of New Jersey and Connecticut were replaced with the bricks of Ohio, Pennsylvania and Virginia. And that brings us up to the brick machinery man and my feelings toward him are in sympathy with the emotions of the dear old gentlewoman, who speaking to her curate said, "Sir, we never knew what sin was till you came among us."

I have heard it contended that this convention was more of a brick machinery convention than a brick convention. Giving heed to the soft impeachment the machinery men should not be ignored. The most chilling thing is a conspiracy of silence. It is better to be abused than forgotten.

I have heard him called the gold brick man of the brick business. But I propose to defend him against that scurrilous, libelous charge. I contend that any man or set of men, who snatches a despondent away from the brink of suicide; who takes the man without hope or faith in the future, and changes his view until he beholds before himself a period of prosperity and power, that man who does all that should not be maligned. That is what the machinery man has done in so many cases, he amplifies the addage, "Any port in a storm." The owner of unproductive real estate who has paid taxes and interest for years, finally goes to the machinery man for deliverance. The soil from the property is taken away, as a gold nugget to the assay office, and finally the machinery man returns with the glad tidings that the clay burns either beautifully light or beautifully dark, and with that announcement, a new brick plant is born!

Wishing to avoid an anti-climax I finish the story there and leave the history of that plant to be written by those whose hope has triumphed over their experience.

The question which obtrudes itself upon the delegates at any convention is, "why do we thus assemble?" While some may attend for a junket, most of us come with a serious purpose. If we depart without having improved the condition of the industry in which our lot is cast, the meeting is without effect.

The birthday of Lincoln is not so long passed but what the mantel of that great personality is still upon us, and I can imagine no more appropriate way to close than to paraphrase one of his famous utterances. Therefore, I say, let us here highly resolve that this convention shall not have been in vain, that this industry under God shall have a new birth of freedom, that greater prosperity may attend us all, and that reasonable profits of the brickmaker, for the brickmaker, and by the brickmaker, shall not perish from the earth.

Toastmaster Hammond: I am sure we have all enjoyed Mr. Lounsbury's "Musings," which is the last on the program.

Secretary Randall: I am requested by Mr. Pettit, chairman of the Ladies Committee on Entertainment, to announce the trip for the ladies tomorrow morning at nine-thirty. They will leave from the Thirty-third street side of the hotel and the trip will cover what is known the up-town trip, out Fifth avenue, over to Grant's tomb and back down Riverside drive, and will be a very enjoyable trip, even for those who may have taken it before. Tomorrow afternoon, starting at one o'clock, the ladies will be instructed into the mysteries of running a big hotel, and will be taken on a tour of inspection over the McAlpin. The tour will be ended on the Mezzanine floor, where tea will be served the ladies, and there will also be a souvenir for every lady. This, I believe, finishes our formal entertainment for the evening, but I will leave the pleasant memories of the occasion stay with you by leaving the conclusion to our worthy toastmaster. (Applause.)

Toastmaster Hammond: I am sure we have all enjoyed Mr. Lounsbury's "Musings" exceedingly. It is the last formal offering of the evening, and now, for once, I am going to have the last word in spite of the obiquitous Mr. Randall. (Laughter.) One of the speakers said that a famous toastmaster had told him that his greatest job was to wake up the audience after each orator had finished. That did not fall to my lot this evening, and I thank you all very much for your appreciation and attention. I asked you in the beginning if you would not help me, and you have. You may have noticed that when I gave you the toast to the President I broke off a little abruptly from what I started to say about our government, and that our fathers had pledged their lives, their fortunes and their sacred honor to obtain liberty, and they have transmitted it to their descendants, and we following have received it as our birthright. Gentlemen, as we each go to our homes, shall we feel that we have each taken some consecration as Americans? Can we feel in our hearts that no matter whether we have been misrepresented by a senator, or by some one, no matter when the crisis may come, America is first with us? (Applause.)

I wish to say also that New York feels highly honored and gratified that you have come to this city for your thirty-first convention, and we trust that during the next thirty-one years you will come frequently, and may we all be here to greet you. (Applause.)

AWAKE AT LAST

The birds have come again! From every bough
Their clear notes ring in carols full and free
And spring is here with garlands on her brow
And in her train a merry minstrelsy.
How swift the change. A few short days ago
The wind was cold that whistled past our door
The branches bent beneath the sleet and snow
And nature, naked, shivered to the core.
So too, my country, hath thy wintry chill
Broken at last. Thy banners float on high
And in thy veins the pulses that were still
Beat fast in answer to the trumpet's cry
Thy blood is stirring like the sap of spring
And shore and plain with martial music ring.

William D. Foulke.

—Indianapolis Star.

CORRESPONDENCE

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CONVENTION ECHOES

Vice President Clippert Back Home.

My Dear Randall:

This letter, though a little tardy because of a very pleasant side trip and week's sojourn at Old Point Comfort, is prompted by a desire to express our appreciation of the splendid entertainment and many personal courtesies accorded us by the New York membership on the occasion of our recent visit.

Kindly convey to them our many thanks and best wishes and say to them that we never had a more enjoyable time.

Yours very sincerely,

GEO. H. CLIPPERT.

A Fine Compliment from a Good Brickmaker.

Friend Randall:

Thanks for a copy of the program, also a renewal blank.

I hasten to add two dollars to the three dollars already forwarded to you. The advance from three to five dollars had slipped my memory. The advance meets with my hearty approval. The money is well spent.

For thirty years I've received valuable information and instruction by being a member of the Association. Randall, you have done, and are doing great work for the good of your fellow man.

With many kind wishes, I am, yours truly,

J. W. McMILLAN.

Milledgeville, Ga., February 28, 1917.

Old Time Member Kept Home By Sickness in Family.

Dear Mr. Secretary:

Owing to sickness and death in the family, I was unable to attend the convention in New York City. I should have liked very much to have been with you and hope that you had a good attendance and a jolly time. I am enclosing check for five dollars to pay my dues as a member of the N. B. A. for 1917.

Will be pleased to get the next edition of the Clay-Worker, that I may have a full report of the proceedings of the convention.

With best wishes, I remain, Yours truly,

R. D. McMANIGAL.

Logan, Ohio, March 20, 1917.

President Salmen Gratified Over Success of Convention.

Dear Friend Randall:

I reached home today at half past ten, feeling considerably better than when I left New York. I think this warm weather will bring me out all right again in short order.

We had a good convention in New York, and everyone I spoke to seems to feel satisfied of the results so far as the National Brick Manufacturers' Association is concerned, nor have I heard of any complaints of our selection of New York as a convention city. I asked several of the brickmakers where they would like to have the convention go next year, and St. Louis seems to have been agreeable to all. Even the Massachusetts contingent who are asking for the convention to go to that state, recognized the policy of the Association to hold the convention in different sections of the country, especially never to leave the center of the Association's constituency more than one year at a time.

Hoping you and the ladies of your party all have reached home safely and found everything in good shape, I am, with best regards, Cordially yours,

F. SALMEN.

Slidell, La., March 13, 1917.

Rowing Around Plant In Row Boat Convention Week.

T. A. Randall, Indianapolis Ind.:

My Dear Sir—Enclosed you will please find check for $5.00 to renew my membership in the National Brick Manufacturers' Association.

Regret very much that the contemplated trip to the greatest convention on record had to be called off on account of a flood in this section of Dixie Land.

While you were wrangling with the usual convention problems, we were rowing around our plant in a row boat, looking for one or more dry spots, or, like the traveler through a desert, trying to find an oasis.

We had eight up draft kilns of 325,000 capacity; two with green brick, one burning, and Tuesday at 5 a. m., after fighting all night with the water, like one in the trenches across the water, it broke loose, put our fires out, and you can guess what happened to the green kilns with three and a half feet of water around them. Our incline to clay pit, 20 feet high, 100 feet long, looks today as if the German shells had made a job of it. Our steam shovel—well, we do not know at this writing if it is standing in mud or water, but according to the appearance of smoke stack, it's not all mud around it.

Elisha J. Kane, Kushequa, Pa.

After all the little trials, we still sail in the optimistic boat.

R. C. GANGWERE.

Chattanooga, Tenn., March 12, 1917.

Machinery Men Appreciative.

My Dear Mr. Randall:

I have glanced somewhat hastily through the March edition of The Clay-Worker, and especially that portion which reports on the sessions of the convention recently held in New York City.

You are to be congratulated upon the success of the convention, and I particularly wish to thank you on behalf of the machinery manufacturers, who honored the convention with their presence, for the very excellent notice you gave to them. This bunch of fellows are always desirous of seeing you succeed, and if you persist in putting our good looking pictures in your journal, you can certainly depend upon having a lot of boosters with you on all occasions of this kind.

I regret exceedingly that I was unable to remain throughout all sessions of the convention.

With regards to yourself and family, I am,

Sincerely yours,
L. W. PENFIELD.

Willoughby, Ohio, March 28, 1917.

From An Absentee.

My Dear Randall:

I want to thank you for your nice letter and the roster. I am glad you had such a good crowd and I was sorry to miss it, but L. D. Binyon and Jas. A. Hogan leased the old plant at Union Furnace and started it up February 21st. They won't work and they expect me to keep them the balance of their lives; they both seem to be very healthy, so I could not see any chance to go to New York. We are working on a large order of fire brick and will not be making any face brick.

I hope by next year I can be with you. Believe me, I will never forget any of the conventions and wish I could go back and do them all over. I really believe I could do a better job next time. Believe me always

Alfred Yates, Shawmut, Pa.

Your friend,
BEN. S. FISHER.

Union Furnace, Ohio, March 17, 1917.

Convention a Great Success.

Dear Mr. Secretary:

Allow me to congratulate you upon the success of our convention at the McAlpin Hotel, New York City. It was a great pleasure to meet a number of the older members of the Association and shake them by the hand. The papers were of the best and reflect great credit on Professor Bleininger and Professor Watts from Columbus. We owe a debt of gratitude to Professor Bleininger for his continued work and effort in the interest of our Association. He simplified his investigation to such an extent that an ordinary craftsman can readily absorb the depth of his papers. It was a great pleasure to meet Professor Orton. He certainly must be delighted to see the development of the American Ceramic Society. He started one of the best institutions in the interest of clay work possible. The development of the Ceramic is simply marvelous and the young men connected with it, brought up under Professor Orton's practical ideas, will produce a body of managers that will largely change the present struggle of clayworking for existence. I note Professor Purdy attended, and it afforded much pleasure to meet him. While he has stepped aside into another line, he still has the same interest in the clay industry and is continually adding to the required knowledge of our Association. I met Professor Parmelee, of Champaign, Ill. I remarked some years ago that this gentleman would be heard from and am very pleased to realize that my judgment of him was proven correct. The paving brick men had their meetings and I think they feel satisfied with future prospects of the industry. Will P. Blair, Charles Deckman and others were in attendance and gave the Association some valuable information. As everybody knows, Charles Deckman can say his piece in such plain English that he will be favorably understood.

Hoping that we shall all live to meet again at our next convention and renew our old acquaintances, I am,

Yours very truly, ALFRED YATES.

New Member Pleased with Convention.

My Dear Ma. Randall:

I want to write and express my appreciation of your very efficient and courteous attention to the meeting of the Association, just held in this city.

It was a pleasure to have been in attendance upon the same.

Sincerely yours,
W. H. TAYLOR.

New York City, March 10, 1917.

New England Brick Men Greatly Benefitted by Convention.

Dear Mr. Secretary:

The Massachusetts delegation surely enjoyed the convention at New York and came away with the feeling that we had been greatly benefitted and broadened by meeting our fellow brick manufacturers from all over the United States and listening to the very interesting and instructive addresses.

Thanking you for all that you did to make it so pleasant for members of the Massachusetts Brick Manufacturers' Association while we were in New York, I am,

Yours very truly,
Sidney H. Francis, Sec.-Treas.
MASS. BRICK MFGRS. ASSOCIATION

Fitchburg, Mass., March 23, 1917.

Best Convention He Ever Attended.

My Dear Friend Randall:

I think the New York convention was one of the best I have attended in years. When you take into consideration the lateness of the season and the unsettled conditions of business throughout the country, it certainly speaks well for our Association when over four hundred men will leave their business to attend the convention. New York City has many advantages for a convention like ours, and, of course, some drawbacks, considering that it is in the extreme eastern part of the country. I really think, when you take everything into consideration, Friend Randall, any fair-minded man will pronounce the meeting a success.

Business in this section of the country is very good. Our only trouble is the labor situation. It is impossible to get sufficient help. At this writing, we have orders enough on the books to keep us going until December 31. During the winter months I installed a new ten-track Standard dryer, and also placed in the factory one of Fate's largest sized machines, to be used in the manufacture of brick and tile for acid factories. During the last year I have worked up considerable trade of this kind, and at present we are shipping one hundred carloads of acid-proof brick to the Imperial Munition Board at Trenton, Ont. As stated before, the year promises to be a good one, with the exception of the help situation, which I believe will improve within the next sixty days.

Trusting you are well, with kindest personal regards, I remain,
Very truly yours,
Corry, Pa., March 27. D. WARREN DE ROSAY.

Enjoyed the Convention Immensely, Especially the Smokerette.

Theo. A. Randall,
Secretary N. B. M. A.

Friend Randall:

Just a line to enclose my annual subscription to The Clay-Worker, and to say that I enjoyed my trip to New York during convention week immensely, that is why I had that Illinois smile all the while. It is true I did not have my spectacles with me at the smokerette, but you are mistaken if you think that I moved nearer the dance floor to see the cabaret singers perform. It was not that, it was the punch bowl, I was awfully dry.

Yours truly,
JOHN T. HUMMERT.
Quincy, Ill., March 31.

Missed Familiar Faces.

My Dear Randall:

I am home from the convention, which, while it was good, did not seem quite like the old conventions to me. Perhaps this is my own fault, but I missed so many of the old friends who have passed on, and while it recalled pleasant memories, it saddened me, too. With best wishes to you all, including, of course, Miss Wallace, in which my wife joins me, I am,

Yours truly,
Wallingford, Conn. ELLIOTT S. MORSE.

Pertinent Suggestions for Future Conventions.

Dear Mr. Randall:

Glad to have your letter of March 17th. I, too, am sorry not to have seen more of you at the convention, but I had ocular demonstration of the fact that you were busy all the time that I was awake, and I have no doubt you kept later hours than I did.

While the convention was a profitable one, it would seem from the attendance, it is not desirable to hold our conventions as far east as New York very frequently. Moreover, while the McAlpin is an ideal hotel, it was not an ideal place for the convention from the standpoint of manufacturers. We were so badly scattered and there was so little information as to where the different firms could be found, that I often found a man hunting in vain for some particular concern.

At Detroit, we were much more concentrated, and there was a bulletin board in the lobby where the address of any concern could be found.

Next year, we shall be disposed to leave the selection of our room in your hands. It seems to us that since we were on the job in New York, that we could relieve you of that this year, but I am not certain that you would have been able to secure sufficient space on the twelfth floor for all of us, even if we had left our reservations with you.

I believe these two items, namely concentration of the manufacturers, and the bulletin board in your office, as well as in some more conspicuous place in the lobby, would add greatly to the convenience of both the manufacturers and brick men, and, therefore, increase the value of the convention to all who attend.

We had some live inquiries and are very confident that we shall land some good business as the result of the convention.

Cordially yours,
C. B. THWING,
President Thwing Instrument Co.
Philadelphia, Pa., March 19, 1917.

THE VOICE OF EXPERIENCE.

Four Rules That Prevent Cut-Throat Competition.

LATELY, MUCH HAS BEEN WRITTEN about unfair competition. Here are a few simple rules, which, if followed, gives a rude jolt to reckless competition.

FIRST—If a prospective customer writes, saying, "He received your quotation and is well pleased with the quality of your brick, but a lower price has been received from a competitor, and if you will meet that price, the order is yours," write back immediately, saying, no doubt but the brick offered by your competitor is well worth the money, but you can't change your price.

Be certain to mail to your competitor a **carbon** copy of your reply.

SECOND—If an inquiry comes from a town where there is a brick plant, tell the inquirer that you make it a rule to not ship brick into a town where there is a brick plant, giving these reasons: To make a sale I would have to cut my price to offset freight charges, resulting in little or no profit to me on the transaction; in addition to that, I would be doing an injury to my brother brickmaker, who has to pay taxes in your town, and whose plant is a benefit to your community.

Be certain to mail, to the brickmaker in that town, a **carbon** copy of your reply.

THIRD—If your order book is well filled, don't get restless and build an addition to your plant. Raise your price and put the money in the bank. Later you may have a pressing use for the money and no use for idle addition.

FOURTH—If inquiries come from points close to where there are plants, don't squeeze your price to make a sale. Quote a price that will yield a profit to whoever gets the business. Never sell brick to keep a competitor from making a sale. Get a profit out of every transaction.

For more than forty years these simple rules, easily followed, have been my guide. I have always sold all the brick I ever made. The result is money in the bank I don't need, and, much better than that, every brickmaker in this section is my friend.

Here is an instance of their friendship: Occasionally some of these good brethren receive inquiries from a prospective customer in my town. Time and again these good brethren have wired me, asking what price must they name, so I would get the order.

We have a saying in Scotland, "Competition is the life of trade, and the death of profits."

No, there is nothing the matter with the brick business; nor is anything the matter with the Golden Rule. Try it, brethren, try it.

"AN OLD BRICKMAKER."

TRADE NOTES

John H. Connelly, Berlin, Conn., is installing a Thew Automatic Shovel.

C. C. McLees and A. B. Dalley have organized the Edisto Brick Company, at Orangeburg, S. C., with $55,000 capital stock.

Wm. A. Perry died at his home at Cambridge, Mass., recently. He was an old time brickmaker, coming from a family of brickmakers, the Perry Brothers.

The Tuttle Brick Co., Middletown, Conn., made in the month of February, on one New Haven machine and standard dryer, thirteen hundred thousand brick—good enough for cold weather.

The Tennessee Agricultural Lime & Brick Co., of Newport, Tenn., has been organized with Henry F. Gau as president. An immense plant on which they plan to spend about $100,000 will be built to have a daily capacity of 100,000 brick and 50,000 to 75,000 4-inch drain tile.

EDITORIAL NOTES AND CLIPPINGS.

Newton Robinson, Jr., will install new machinery at his brick plant at Elizabethtown, N. J.

The Kingsport Brick Co., of Bristol, Va., has increased its capital stock from $250,000 to $350,000.

H. J. Wamez and George Mark will start a brickmaking plant at New Duluth, Minn., as soon as the weather will permit.

The Duckworth Brick Company, of Morganton, N. C., has been incorporated with $100,000 capital stock. E. D. Duckworth, E. D. Phifer and others are interested.

The Okmulgee Brick Company, of Okmulgee, Okla., has been chartered with $40,000 capital stock by W. B. Pine, J. W. Hammond and G. W. Mabrey.

James A. Ridgeway, New York City, has sold to The Berlin Brick Co., Berlin, Conn., a Fate & Co. gasoline locomotive for hauling their clay from clay bank to machine.

A charter has been issued to the Bluefield Brick and Tile Co., of Bluefield, W. Va., with capital of $25,000. Incorporators are Chas. F. Mustard, W. L. Mustard, C. S. Dieffenderfer, D. E. Douglass and R. B. Parrish, all of Bluefield.

The first carload of fire brick from the new factory of the Moscow Fire Brick & Clay Products Company was shipped out recently. The brick company has just completed two kilns each of 100,000 capacity. Work was begun on the factory last fall.

Edwin F. Knight, president of the Buffalo Clay Products Company, Buffalo, N. Y., writes that he would like to get in touch with manufacturers of radial chimney blocks, as he has an order on his books calling for delivery by July 1st. Fire clay blocks are preferred.

The Berlin Brick Company, of Berlin, Conn., has taken over the brick business of H. S. Tallard who has been operating the plant of the Berlin Brick Company for the past five years under lease. Mr. Tallard will go into another line of business and Mr. Doty, of Pittsfield, will manage the plant for the company.

The $300,000 plant of the What Cheer Clay Products Company, What Cheer, Iowa, was damaged to the extent of $18,000 by fire, and three workmen were injured, one perhaps seriously. The flames started in the carpenter shop which was destroyed, swept into the blacksmith shop and then into the lumber department. The loss by fire was $10,000 and the loss to raw tile by water nearly as much. The cause of the fire is unknown.

Walter Schapper, 192 North Clark St., Chicago, Ill., advises us that after being associated with his father, Ferdinand C. Schapper, for the past twenty years, as sales representative of the Roessler & Hasslacher Chemical Company and the Perth Amboy Chemical Works, he has gone into business for himself under the firm name of the Schapper Chemical Co. Mr. Schapper is in a position to quote manufacturers on a general line of chemicals, pharmaceutical and dyestuffs.

At the annual meeting of the Minnesota Farmers Brick and Tile Company, Austin, Minn., it was voted to change the corporate name to the Austin Brick and Tile Company. The annual election of officers also took place. The new directors are M. S. Fisch, of this city; F. Showalter, of Hampton, Iowa, and J. B. Bleeker, of Ackley, Iowa; President John Rahmy; Vice-president M. S. Fisch; Secretary and Manager W. H. Gleason; Treasurer J. L. James, of Thornton, Iowa.

(Continued on page 430.)

of San Francisco. The California Clay Corporation has taken a fifty-year lease on 30,000 acres of clay-bearing land near Ione, and will engage in the manufacture of fire brick, partition tile, ducts and conduits, sewer pipe and building blocks. The erection of a $65,000 plant with a capacity of 3,000,000 brick per annum, is to be begun immediately.

OBITUARY

Death of Murrell Dobbins, in His 74th Year.

MURRELL DOBBINS, for many years one of Philadelphia's most prominent citizens and a pioneer brickmaker, died April 6 at his home in that city. Mr. Dobbins has been in poor health for some time. He was born at Pemberton, N. J., August 29, 1843. In early manhood he was an active factor in brickmaking industry in that section. A decade or more ago he became interested in the Camden Pottery Company, and was president of same at the time of his death. Mr. Dobbins was a man of conspicuous ability, was prominent in municipal affairs, having served as city treasurer for two terms, and as president of the Master Builders Exchange, one of the strongest organizations of the sort in the nation. He was the father of the Philadelphia Trade Schools, and rendered signal service to builders through his labors in connection with that important enterprise. He was also president of the Board of the Eastern State Penitentiary. He was a quiet and unassuming, but very forceful man and served his city and state efficiently in many ways during his long and busy life. Among his intimates he was known and recognized as a most companionable man. Funeral services were under the auspices of the Masonic Knight Templars, a fraternity of which he had been an active member for over half a century. He is survived by his widow, a daughter and a son, T. Monroe Dobbins, who has been associated with him in all his business affairs during the last decade.

The Late Murrell Dobbins, Philadelphia.

TO MECHANICALLY HANDLE BRICK.

A device for mechanically handling brick has been developed by R. A. Fontaine, Route No. 5, Roanoke, Va. This consists of a body and loading device for loading and unloading brick without the use of manual labor. It is claimed the brick receive no jars or shocks and are left in neat piles ready for use. Further claims are that it reduces labor, saves the brick from rough handling, reduces the expense of delivering and enables automobile trucks to run continuously in making deliveries.

Aetna Brick Co., of Crescent, N. Y., will resume operations on April 1. The concern has already contracted for its entire output for ten months, amounting to 10,000,000 brick.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

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☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis

Vol. LXVII. APRIL 6, 1917. No. 3a

My Country, Right or Wrong—My Country!

CURRENT COMMENT.

You can now read all about it.

* * *

The stay-at-homes who failed to go see the bright lights also missed a good convention.

* * *

The next best thing to attending and taking part in a convention is to read carefully all the things that were said during the sessions.

* * *

One of the good features of the N. B. M. A. annual in New York was in the more than usually prompt and regular attendance of the delegates at the sessions.

* * *

Buttonhole talks and visits among the convention delegates prove a source of profitable information as well as a pleasing exchange of friendly greetings, and for a good mixer the convention trip is worth while for this alone.

* * *

One good answer for the man who would ask what the National Association has done in the way of good work for the industry is, to look the industry over as it stands today, compare the methods and products with thirty years ago, then consider the part the meetings and the workers have played in helping the progress along. The answer will be found plentiful and varied.

* * *

Constructive criticism is a wholesome thing, but backbiting, fault finding is another kind of thing—and not a bit wholesome.

* * *

From the way it looks now the summer crop of "whoppers" will be garden stories this year instead of fish stories, for at this writing garden clubs are more of a popular pasttime than fishing and hunting clubs.

* * *

The coal situation has been relieved somewhat and coal can be had now, and at prices lower than during the cold weather, but the coal folks, after sampling the better prices, like them so well that every man using coal is likely to find a necessity for revising his figures on fuel cost.

* * *

There is a saying about Americans being willing to fight for peace, which is in a fair way of becoming an important fact in the history of the world today. Also there comes a time when fighting for peace is more effective than praying for it.

* * *

No matter where our sympathies center on the other side of the ocean, our best interest as well as our national loyalty is centered in the whole-hearted upholding of the hands of our own government—and nothing else should be permitted to interfere.

* * *

An attendance of more than 700, including the ladies, and the ladies count in all public gatherings these days, is of itself a sufficient answer to the self-appointed critics of the N. B. M. A., who, for purely selfish reasons, would, if they could, belittle the influence and importance of our national organization, which, as the whole world knows, is the largest and most influential body of clayworkers in the world.

* * *

The railroads, after accepting the eight-hour day under protest, will now pass it on to the shippers by revising their freight rates upward, and in the end it is the public which will pay those wage increases—which reminds us that neither the railroads nor the brotherhoods are inclined to show consideration for the public. Just so they get their's seem to be all they care for, and the public can be—good and pay the bill.

FOUNDATION WORK.

From time to time during the past year or two The Clay-Worker has made it a point to call attention to foundation work and the opportunities for the brick men to enlarge their trade by meeting the competition of concrete here. From talks with brick manufacturers it has been learned that in addition to the use of common brick for building basement and foundation walls, and hollow clay tile to secure certain insulating qualities, there is also in this foundation work a good chance to market off grade face brick and paving brick. In some sections of the country paving brick manufacturers enjoy a splendid demand for No. 2 pavers, to be used in foundation work. It is contended that these make a foundation even more satisfactory than stone for those who are seeking special quality in foundations.

Both paving brick and face brick have the quality of small absorption of moisture and of standing up under heavy pressure. These qualities should help them along considerably in competition for the more critical foundation work, and more trade in this line might well be secured by seeking for and developing it. Moreover, there is room for good mission work all around, for more of this foundation business. Too much of it is going to concrete, and a whole lot of the concrete is used simply because it has been extensively exploited for this purpose.

The use of concrete calls for forms and expensive preparation, whereas brick and tile can be laid without the forms and when properly laid makes a better foundation. It looks like all we need to get more of this foundation work is to go after it, and that is what The Clay-Worker desires to urge all the brick craft to do—go after more of this foundation work and keep after it.

RESEARCH IN NATIVE CLAYS.

One form in which some compensation from the great war is coming to the clayworking industry of this country is in that it is leading to more active and widespread research among our native clays. We have always known that we have wonderful resources, wonderful in diversity as well as in quantity and distribution, but so long as it was easy to fill certain requirements from imported clays we didn't bother so much about hunting among our own resources to fill those needs. Now we are being forced to do this in some instances, and it is proving so interesting and worth while that we are developing a keener interest in the whole proposition of research among our native clays. It will take time and some of the returns will be slow coming in, but eventually we will benefit largely from this line of activity, which has been stimulated largely by necessity growing out of the interruption to imports of certain clays and burned clay products.

BRICK MACHINERY ABROAD.

Practically all of the old world will be looking to the United States for some of its modern labor-saving machinery when the reconstruction days come. The foreign demand for clayworking machinery will undoubtedly be a big item in the future.

Already there are foreign countries outside the war zone investigating and turning to this class of machinery, and we may expect in time a sort of world-wide boom in American clayworking machinery.

All of which is a reminder, too, that some time ago there were reports that American machinery is at work making brick in what it is claimed was the original site of the Garden of Eden. It seems that the Arabs have been taught to use American machinery, and they are pleased with the results.

TRUST YE ONE ANOTHER.

Some of the best argument that can be found in favor of brick manufacturers and dealers being frank and trustful with each other is contained in the fact that wherever the brick men in a community get together in a friendly way, and exchange freely ideas and information, they find the way much easier for themselves and profit much better than where they hold aloof from each other and look with suspicion toward whoever is a competitor. Those who get together in the right spirit find an advantage in exchanging information about their customers, and learn in this way to weed out the deadbeats, who to trust and who not to trust, and they gain much for themselves that is lost to those members of the trade who are fearful of trusting one another lest the other fellow take some advantage of information obtained.

It is admittedly a time of co-operation and for local organization. No local organization can be as effective as it should if it is hedged about with a wary guarding of information from each other. We have long since learned that the exchange of information about manufacturing methods was plainly profitable to all concerned, and it is time now for us to realize that the exchange of commercial information offers its advantages, too. It is time to be trustful of one another and work together instead of separately and in antagonism.

PORCELAIN ELECTRICAL SUPPLIES.

The greatest development made in any one line of clay working industry during the past twenty years has been made by porcelain electrical supplies. This is an item that was practically unknown in the clayworking here of twenty-five years ago. Back in 1898, it had developed to the point where the annual production, according to the statistics of the U. S. Geological Survey, amounted to a total of $451,677. Today the total is somewhere between five and six million dollars a year, a twelve-fold increase. The statistics are not yet available for 1916, but during the calendar year 1915 the total production of porcelain electrical supplies amounted to $4,671,202, and undoubtedly 1916 was a good year, and the rapid extension in the uses of electricity indicates very plainly that 1917 would be a big year, perhaps breaking all previous records and making a total in these products of a round six million dollars.. There are other branches of the clayworking industry considerably larger than this, but there is no one branch that has shown greater development or more rapid growth. Moreover, it is one that has promise of still great things in the future.

INTERIOR TILE.

The Building Review, of New Orleans, has lately been giving considerable attention to the progress of interior tile in the South, and among other things has found on investigation that burned clay tile is the greatest tile product of the world. Quoting from Sir Charles Lyell's "The Antiquary of Man" as a preface to the treatise on the subject, the discovery is made that "granite disintegrates soon into quantities of mica, quarz and feldspar; marble soon moulders into dust of carbonate of lime, but hard, well-burned clay endures forever in the ancient landmarks of mankind."

The investigation by this publication showed that F. Codman Ford was the first to engage in the tile business on any large scale in New Orleans.

It is found that burned clay tile is making considerable progress in the south country and has preference over marble and other tile, and heretofore tile for interior as well as roofing tile has been largely handled as a side line by people handling other building material. Now, however, it has reached the point where some are specializing in it. The Southern Tile Company is one case, of which Jos. Ariatti is the moving spirit. This concern specializes in tile alone and by such specializing has contributed materially to the advancement of tile in building operations in New Orleans.

FEDERAL AID IN VOCATIONAL EDUCATION.

By enacting what is known as the Smith-Hughes Law, Congress has prepared the way for federal aid in vocational education broadly speaking along somewhat similar lines to the federal aid which has been given in highway construction.

The Federal Board of Vocational Education is created by this act, to consist of the Secretary of Agriculture, the Secretary of Commerce and the Secretary of Labor, U. S. Commissioners of Education and three citizens of the United States to be appointed by the President and approved by the Senate—one representative of agricultural interest, one representative of manufacturing and commercial interest, and one representative of labor. The appointed committeemen to receive a salary of $5,000 a year.

The aim of this law is to furnish federal aid to those states which will come under its provision and qualify to administer the matters as it should be, and to do their part generally.

In other words, they must create a state board in conformity with the requirements set forth in the law.

It is not proposed here to go into the details of the technality of this proposition. Any one interested in this phase of the matter can obtain pamphlets covering the matter by addressing H. E. Miles, Racine, Mich.

The point of particular interest to the clay working fraternity in this federal aid proposition for educational work is in that part of it which tends toward the line of trade teaching that has long been advocated by clayworkers. The broader term of vocational education is used in this work because it involves three branches of effort. One directed toward home economics, one toward agriculture and the other toward industry and manufacturing business. It does not get down to trade school work specifically as the one definite object, but it does include this as a feature, and it is perhaps safe to assume that the more interest manufacturers take in the subject the larger and more important can this feature of trade teaching be made in working out the plans of the board in charge of federal aid to vocational education. The matter is commended for earnest attention on the part of those who have manifested an interest in school work and kindred undertakings.

BY-PRODUCTS.

From time to time The Clay-Worker has touched incidentally upon the subject of the possibility of by-products from the clay-working industry. In one instance recently mention was made of government experiments in distilling gasoline and oil from shales as suggesting possibilities for research work and a problem for our chemist to find if something useful could be obtained as a by-product from burning clays and shales in making brick.

Also, mention was made of some of the cement factories in the United States reducing the dust nuisance of the cement factory to a paying by-product in the form of fertilizer, which again brought up the possibilities of by-products in the clay-working industry.

There is an echo of this latter point from Canada in a report that a company making Portland cement at Durham, Ont., is now turning out as a by-product from the felspar twelve to sixteen tons of potash daily.

In this case the felspar is used with limestone as a raw material for cement and a process has been evolved for collecting liberated potash. This plant, it is said, has eight kilns, and the output of potash as a by-product amounts to fifteen tons a day. In addition to this, it seems they are able by trapping dust and gases containing 5 per cent. of potash to make a valuable fertilizer.

It is reported that the chemist in charge of the plant says that within five years every cement plant in Canada could be producing potash as a by-product. Also that the cost of manufacturing potash in Canada from felspar is so low that even now it is less than the freight heretofore paid on that imported from Germany before the war.

All of which reminds us of two things. That we need potash for fertilizers for the one thing, and we have what may be undeveloped possibilities in the way of by-products in the clay-working industry. Whether or not these by-products may be potash, or something else, the fact that by-products are being developed in other somewhat related industries should lend encouragement to research work with a view to developing interesting and valuable by-products in the clay-working industry.

It is rather remarkable that those who seek by questionable methods to profit by a great convention are the only ones to carp and sneer at it, and by misstatements and a pretended show of figures, endeavor to create the impression that the organization is of little or no consequence. It is a queer, unclean bird that fouls its own nest. A bathtub is really a good place for such human birds to sleep in, for sanitary reasons.

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TRADE LITERATURE.

AN EXCEPTIONALLY ATTRACTIVE catalog of brickmaking machinery has been issued by Chambers Brothers Co., of Philadelphia. The cover design is simple, but pleasing, the border and ornamental features being composed of rows and squares of brick. An unusual but commendable feature is a table of contents by which the reader may quickly locate any particular machine or apparatus that may be desired. It is especially desirable in this particular instance as the catalog includes 136 pages of well arranged text and effective illustrations. In the foreward the fact is mentioned that Chambers Brothers Co. have for over fifty years devoted its energies to the special line of stiff clay brick machinery, and adds, "Our machinery is today the recognized standard of its class and is in the front line of mechanism devoted to clayworking." The illustrations are mostly halftones of exquisite character showing the principle features and characteristics of each machine or device distinctly, as only fine halftones can. The final illustration is interesting as a bit of trade history, it is a view of the ring pit tempering wheel, formerly used for grinding and tempering clay for molding brick by hand, and is a reminder of by-gone methods which are in marked contrast with the up-to-date processes now in vogue. We presume a copy of this interesting book can be had for the asking on application to the Chambers Brothers Co. See ads on pages 346-347.

THE HOUSE PLAN PROPOGANDA

SUGGESTIONS FOR BOOSTING THE BUILDING BRICK BUSINESS

THE HOUSE plan has long been a factor in promoting the sale of material for home building. It is a pet vehicle for the lumber trade for promoting the use of lumber, and it has served as an entering wedge for the mail order people to get into the building game for the sale of lumber and shingles; but, somehow, so far the house plan idea has not been used extensively in promoting the use of brick.

There are some reasons, and it is the intention here to go into some of these reasons and to air more or less thoroughly the entire house plan propaganda, to the end that we may have a better understanding of the matter and may be in a position to weigh the house plan ideas of various kinds offered for what they are worth.

The idea of using house plans to promote business in the building line, that is the idea which led to the propaganda of the present day, has been developing through a period of twenty years more or less.

Back something like twenty years ago there was established a lumber publication in Chicago, one of the strong features of which was house plan outlines and articles pertaining to house building and home furnishing. This feature was strong enough that some people, contemplating building of homes, subscribed for the paper just to get copies of plans.

By and by, this idea took on a larger scope and developed into a proposition to furnish plan books to retail lumber dealers, with the name of the retailer printed on the outside cover of the book. The retailer, by distributing these books to contractors and prospective builders, would stimulate a desire for building and suggest definite plans that often had the effect of encouraging and developing a decision to build. An arrangement was made whereby blue print plans of any of the sketches could be had for a comparatively small sum, that is as compared to the cost of employing an architect. And out of this idea there was built up an immense architectural publishing business, with a great series of plan books devoted primarily to frame houses, but lately made to include designs for concrete and brick.

Meantime, the idea has appealed to many other people, and we have a regular bombardment of plan ideas coming from dozens of different sources. The red cedar shingle people get out books of bungalow plans, especially designed to encourage the use of shingles; the southern pine people issue a list of plans, the cypress people and other organized lumber interests, and meantime this idea developed a number of other plan publishers of the book and magazine type, who are in the business purely for the profit of the publishing end of it.

The plan idea has even made an appeal to the mail order houses, and some idea of the strong play they have been making of it can be had from the fact that in the Saturday Evening Post some time ago there was a two-page advertisement of the North American Construction Company, of Bay City, Mich., the colored center piece of which is a shingled bungalow in plain outline, over which they rave for the benefit of the prospective builder in the following language:

"Imagine any carpenter attempting to copy this charming home and do so without Aladdin's help, plans and instructions. Think of the harm that would be done to the beautiful lines, the quaint attractiveness of this design. It would be impossible for the greatest of carpenters or other builders to fashion and build this or any other Aladdin and make it exactly as Aladdin builds it. Stop and consider how much he would hurt the beauty of this design if the windows were a trifle out of position, if the door detail was any different, if the roof pitch was built incorrectly. The interior woodwork, doors and stairways are beautifully finished and carefully selected for the prettiest grains and natural wood markings. Any finish, oak, mahogany or white enamel will be supplied."

Of course, the mail order people feature lumber and shingles. They can sell that by mail and they can also sell metal lathe for stucco building, and evidently they sell them, too, or else they are wasting a lot of good money advertising.

It is enough to make the average architect tear his hair with rage to see how they rave over the simplest kind of a cottage design, that could easily be duplicated by any kind of a clodhopper of a carpenter or contractor. Still the fact remains that they get attention and inspire building, and it is this fact which makes the house plan propaganda one for serious consideration by the brick trade.

And now comes a point that it is easy enough to understand, but a little hard to get around, and that is the fact that brick manufacturers generally are handicapped when they undertake the use of this house plan propaganda to promote the use of brick in home building. There is immediately aroused antagonism on the part of the architects. This is easy enough to understand, because heretofore most of the homes built of brick have been of some pretensions and have called for the services of an architect. In other words, the architect is accustomed to designing the buildings in which brick are used, consequently he naturally feels that if the brickmakers get the habit of distributing ready-made plans of brick homes it would materially curtail the chances for architectural business on the one hand and perhaps impair the architectural beauty of the country on the other hand.

From time to time brick manufacturers have approached the idea of printing extensive plan books, and circulating them with plans of course, showing brick homes of the same style and type of frame homes, which have been so conspicuously featured in this manner, to encourage the use of brick. Generally, however, these ideas have either been frowned down upon by the architects or the brick trade has hestitated about pushing them conspicuously, for fear they might arouse the antagonism of architects, and thus lose in the favor of the architects more than they would gain on the other hand by encouraging the general public to select ready-made plans for brick homes.

Back of it is another fact that has bearing, the fact that heretofore the architect has had but little finger in the pie of designing cottages and modest homes. The lumber people and plan book publishers have held a sort of monopoly of this, and the great problem of the architects of the country has been that of how they may get into this modest home building and benefit themselves materially, while at the same time insuring more artistic home building. Meantime, we might mention in passing that while the architects are inclined to frown upon the efforts of brick manufacturers to push ready-made plans, they do not refuse to specify lumber in building operations, because the lumber and shingle people boost the ready-made house plan game industriously. This phase of the matter makes it seem like the brick man is getting the worst of it in the matter of sentiment.

Lately there has been introduced into this battle of house plans an entirely new element, a sort of state-aid proposition, in which architests themselves are taking a hand.

In Minnesota there has been organized a movement for better home building under the auspices of state authority, and a department created known as the Minnesota State Art Commission, which in co-operation with the Minnesota Chapter of the American Institute of Architects is seeking to develop the artistic side of home and community planning. In this work they have taken up plan publishing as a sort of state aid proposition. They have arranged with the architects to draw a series of plans, including quite a number of village homes, farm houses and all the different types of houses that it is thought will be called for in the building of modest priced houses in various parts of the country. Seemingly, the architects virtually contribute their services without immediate returns. Perhaps indirectly they will get some returns. There is seldom a house plan published but what it is lacking in some manner the fulfillment of the exact desires of a prospective builder. Generally the builder wants something similar, but differing, and this may result in the architect getting enough calls for service to draw different plans to compensate them. Anyway, it is hoped that the efforts of the Minnesota State Art Commission and the architests will result in instituting an order of better home building, where art and architects will enter into the planning of communities and homes and the furnishing of them.

Some of these plans are published each month in a monthly publication gotten out to carry on the work, and arrangements have been made to supply blue prints of them at a very nominal cost—a cost that enters in competition with the various offerings of architectural publishing concerns.

That Minnesota State Art Commission is pleased with its efforts so far, too; in fact, it thinks so well of them that it is inclined to spread out and make the effort country-wide instead of confining it to the one state of Minnesota. Just how far they may spread with the idea and whether or not other states may be encouraged to take it up, and other state chapters of architects to take a hand in the game, so that they may get in closer touch with the planning of modest homes, remains to be seen.

Meantime, however, this new proposition coming from Minnesota has a feature of particular interest in it to the brick manufacturer; for it is impossible to promote better and more artistic home building without suggesting both directly and indirectly a more extensive use of brick for the work. In other words, it is the one effort at plan publishing that seems to point the way directly toward a higher order of artistic effort and the use of brick to secure the best that can be had in home building.

The architectural publishing concerns, those which look for their profits directly from the publishing business, are turning much more attention to brick now than formerly, because they recognize that brick is to be used more extensively, and that to get new features worthy of special notice into their plan offerings they must turn to brick as the coming material. The others, though, the lumber and shingle people—people who are concerned mainly with promoting the sale of products—deal almost exclusively in what might be termed the cheap and catchy plans, which are incidently becoming a central feature of the advertising of mail order houses and those making portable cottages and ready-cut houses, in which it is proposed to eliminate, not only the retail dealer, but also the local carpenter and builder.

Brick does not lend itself readily to the mail order business, nor does the proper conception of a brick home make good material for the exploitation of cheap, clap-trap plans. Brick has permanence, and he who plans to build with brick is naturally inclined to plan carefully, because he realizes that he is building for the future as well as today. Therefore, he is much more likely to employ an architect for the designing of his home than to take up with some ready-made plan.

Meantime, the brick trade is confronted with this fact—the ready-made house plan is a big factor in promoting the use of other material than brick in building operations, and somehow, in some way, the brick manufacturers in promoting a more extensive use of their product in home building must meet the situation and take some active part in the matter of house plan designs, with a view to encouraging more building.

The question is, how?

Editorial Notes and Clippings—Continued.

M. S. Bowman and L. L. Jones, both of Los Angeles, who make up the firm of Bowman & Jones, have leased the brick yard at Atascadero, Cal., and are operating it with a force of about fifty men. W. L. Mulford, of the Mulford Vitrified Paving Company, of Los Angeles, is superintendent for the new holders.

The Kortkamp Brick & Tile factory, Hillsboro, Ill., is to be operated by the Dennison Interlocking Tile Company, of Cleveland, Ohio. The new company will sink a shaft to a bed of shale underlying the plant, and said to be of a quality necessary for making the very best grade of brick. Ten up-to-date kilns will be constructed and the latest improved machinery used.

The Tacoma Smelting Company has awarded to the Alphons Custodis Construction Company, of New York and Seattle, the contract for the erection of its new smokestack. This stack will be the largest in the world, being 571 feet high and 25 feet wide at the top, and the 3,000,000 brick used in its construction will be furnished by the Denny, Renton Clay and Coal Company.

Mr. Joseph Towers died at his home on Stanley street, New Brittain, Conn., last month. Mr. Towers was born at Haverstraw, N. Y., in 1860, moved to Connecticut in 1888, and has been in the brick business all his life. He was president of the Central Connecticut Brick Exchange, and one of the county commissioners of Harvard county in 1910. Mr. Towers was a member of the Connecticut legislature, representing the city of New Brittain.

Beginning the first of April, the Purington Paving Brick Company started their employes on an eight hour basis, without a decrease in salaries. The company has been greatly handicapped by coal shortage during the winter months, but are now running to full capacity. A number of improvements have been made in the plant during the winter months. The company now has orders on their books to keep them running steady for three months.

The plant of the Cannelton Clay Products Co., Cannelton, Ind., replacing their old machinery with a new four-mold Boyd dry press and a new nine-foot heavy duty dry pan, increasing their capacity from 15,000 to 20,000 brick per day. They will also build two more kilns, making a total of five kilns. The officers of the company are Lee Rodman, president; M. F. Casper, vice-president, and L. J. Brenner, secretary, treasurer and general manager.

Application for a charter for the Castle Clay Company, of New Castle, Pa., has been made by Fred R. Kanengeiser, Paul Kanengeiser, S. D. Pearson and C. H. Oakes. Mr. Fred Kanangeiser for a number of years has been superintendent of the paving brick plant of the Bessemer Limestone Company, which was recently taken over by the Metropolitan Brick Company, and it is safe to predict that the new company will meet with success from the very start.

Wilson A. Philips, owner of the Philips Clay Products Company, Trenton, N. J., sellers of the Sayre & Fisher bricks in this district, has expanded by acquiring an interest in the American Hollow Tile Company, Incorporated, with a large manufacturing establishment between Hightstown and Cranbury, N. J. This concern has just increased the capacity of its plant by installing several thousand dollars' worth of new and modern machinery and now has a capacity of 100 tons of manufactured product daily.

George C. Holberton, manager of the Pacific Gas and Electric Company here, has been named president of the California Clay Corporation; Arthur S. Cunningham, of Ione, Cal., manager of the Ione Firebrick Company, will be vice-president and general manager of the new corporation; Jas. R. Kieth, secretary, and E. V. McGinty, treasurer.

THE CLAY-WORKER

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WHY I THINK BRICK ROADS ARE THE BEST.

By John W. Sibley, Secretary Southern Brick Manufacturers' Association, in "Good Roads in Florida."

PERMANENCY IS THE KEYNOTE of all modern construction work. We see this manifested in the building of fireproof houses, office and public buildings and the modern factory structures.

With the introduction of new elements of destruction by the evolution of the means of transportation from the pack horse of a few centuries ago, who was superseded by animal-drawn wheeled vehicles and in the present generation the mechanically-drawn vehicle with its even increasing volume of load and rapid movement, the demand for permanency in road construction has become paramount.

We are learning at great cost that temporary makeshifts will no longer answer, and that building well at the outset means economy in the long run.

Hyde Park Ave., Tampa, Fla., Paved With Coaldale Block, Eighteen Years Old.

In the great movement for better roads that extends from coast to coast and from the Great Lakes to the Gulf one hears the same cry—permanency. "Give us a permanent road" is heard wherever the subject is discussed. And that is the goal the highway commissioners and road builders of the nation are striving to reach.

A permanent highway is one that is built of material that is durable—one that resists wear, that resists the destructive forces of nature, that withstands the ravages of time.

No road that requires constant repairs to keep it in a usable condition, that necessitates resurfacing or that must be rebuilt after a few years is a permanent road.

A highway that does not outlast the bonded indebtedness that made it possible is wasteful extravagance, and under present traffic conditions is a case of "saving at the spigot and losing at the bung."

When measured by these standards, I feel it can be safely claimed without fear of successful contradiction that the vitrified brick highway occupies the position of pre-eminence in satisfactory service.

Now "to the law and testimony": The United States Department of Agriculture in Bulletin No. 373, issued August 25, 1916, says:

"The experience of forty-four years has demonstrated that it is entirely practical to construct satisfactory brick roads. These roads now are giving general satisfaction, when properly constructed. No brick pavement which has been constructed in accordance with the best modern practice has yet worn out."

The United States Government, to prove its faith by its works, used vitrified brick exclusively in its road construction in Panama. The Government also will build several miles of vitrified brick road in Ohio as a part of the great national highway system, and as a model for similar construction work, and has given that state financial assistance for the construction of the remaining miles of the national highway across the state.

In Cleveland, Ohio, and Cuyahoga county, the commonwealth in which Cleveland is located, there are 1,200 miles of vitrified brick streets and highways. Some of these were built more than a quarter of a century ago, but because they were constructed of permanent material they have not cost the taxpayer one cent in repairs and are good for many years to come.

In an interview with John D. Rockefeller, published by Elbert Hubbard in the Fra Magazine, the Standard Oil King said:

"The idea seems to prevail at present among the big road builders that the only road we can call 'permanent' is the brick road. Brick wears more slowly than any other substances. That is to say, it is a road that will last longer than any form of road of which we know. It is skidless, mudless, dustless, and should last a generation. In case imperfect brick are laid, or accident occur to the road, to lift out the brick and replace them, is easy. Thus we get a road that can be repaired at a minimum of expense."

During a recent session of the short winter course in highway engineering of the University of Illinois, President A. D. Gash, of the Illinois State Highway Commission, delivered an address in which he discussed various features of road construction and pointed out the broad relationship of paved highways to civilization and to other civilizing agencies in every field—and among other things said:

"The best type of road that we know, in my opinion, is a vitrified brick road."

Many hundreds of miles of vitrified brick highways have been and are being constructed in the state of Illinois. The same is true of the great states of Ohio, Indiana, New York, Pennsylvania and West Virginia and many other sections of the country, which space forbids my mentioning in detail.

But this article would not be complete or fulfill its mission to your readers without a resume of the history of brick highway construction in the state of Florida.

Some seven years ago Duval county, of which Jacksonville is the county seat, decided to pave a few miles, using second quality brick, laying them on the flat and filling the joints with sand. This was giving brick a severe test under most unfavorable conditions. But the results were such an improvement over other types that a million dollars of bonds were voted for brick highways.

Nothing has been spent for repairs and the wear on the brick has been insignificant, though by reason of the crude construction and the irregularity of the second quality brick, there are depressions and displacements.

Some three years ago Hillsboro county, encouraged by the results in Duval county, as well as the splendid record of the brick-paved streets of her own city of Tampa, voted a million dollars for brick roads and early in this year completed the splendid system, as far as the bonds would permit.

Following closely on the heels of Hillsboro came Orange county, with $700,000 bond issue and the construction of 75 miles of as fine brick highways as can be found anywhere in America. Through this county the Dixie Highway extends for 42 miles, a solid ribbon of brick, and Osceola county has extended it three miles to the town of Kissimmee.

Following the advice of their most efficient and far-sighted engineer, G. R. Ramsay, Orange county inaugurated the use in highway construction in Florida of brick with cement grout filler.

The completion early this year of the Winter Park, Maitland and Lake Barton grouted brick roads has not only made them the motorist's delight, but established a standard of permanent construction that has been adopted by numerous other counties in Florida.

Almost coincident with Orange county, was the voting of $750,000 by St. Johns county. During last year bond issues

A Country Highway, "Somewhere in Florida," Recently Paved With Vitrified Brick, Grout Filler.

St. George Street, St. Augustine, Fla., Paved with Brick, in 1898. Sand Base and Filler. No Repairs Needed in Nineteen Years.

aggregating nearly three millions of dollars were voted for brick roads by Volusia, Seminole, Putnam and Pinellas counties and the contractors are rapidly completing the construction of same.

DeSoto county this year completed some fifteen miles of grouted brick highways near Wauchula, being the most southern point in the United States where permanent highway construction has been done.

MILWAUKEE AND WISCONSIN BRICK NEWS.

BRICK IS MAKING the most phenomenal run in its history in the building campaigns of 1917 in every part of the Badger state. It is being used for every purpose to which its adaptable. Homes, stores, factories, garages, shops, warehouses, and even barns are rising like magic from the clay of the earth.

"Brick is certainly coming to the fore as a choice building material. For the past several years it has been making big strides to arrive at a place of prominence on the building list, and if it continues its present speed its place will be insuperable."

The above is the expression of a prominent Milwaukee leader in brick activities who did not "wish to express an opinion," but whose enthusiasm defeated his assumed reticence.

Brick is here to stay as a factor in paving construction. There is nothing to arouse doubts as to the superiority of brick as a medium of travel. Facts and figures of brick manufacturers reveal that with the opening of the present season the demand for paving brick has outstripped preparation for demands. Brick has merited its position in the paving world by the obvious economy in its use. First of all is the cost, as compared with other materials; second, is its adaptability to handling, and third, the facility it offers in the making of repairs. These three points, combined with its inherent quality—resistance to pressure and abrasion—are the convincing arguments in paving circles that brick must come to the fore. It is the belief in Wisconsin that commencing with this season brick is to be put in the ascendancy to the position of leadership in the lines of paving. The only argument against it is based on the noise created when traffic and brick meet, but as old Abe Martin once said, "Show me a town without noise and I shall have no trouble in showing you a dead town."

What brick will do in the future is indicated by the following instances of progress, all of which are but characteristic of what brick is doing and what is being done with it in turn, and which are submitted as a barometer indicating fair weather.

Take, for an instance, the following from the Racine Daily Journal of recent issue: "Building operations in Racine are at a standstill because of the impossibility of securing brick, due to the car shortage."

THE OLD WAY

Typical Florida Road Before Paved

Grouted Brick Pavement Near Deland, Fla.

THE NEW WAY

Dixie Highway Near Orlando, Fla.

All Wisconsin handlers and producers of brick are optimists and boosters for their own territories. They have the right business principles. G. A. Krasin and Louis Hartl, officers of the Marshfield Brick & Tile Company, recently spent a week inspecting brick and tile plants in southern Wisconsin and Illinois. They report that there is a general rarity in clay that can match that of Wood county.

A new clay has been found on the farm of R. S. Hutchinson, north of New London. Mr. Hutchinson has burned a quantity and found it to be of fine quality and much harder than any he has tested heretofore in this section of the country. There is a deposit with an average thickness of ten feet, covering from eight to ten acres. He is pleased with his find, for from all indications it will prove invaluable in the production of paving bricks because of its hardness.

The brick business, in accordance with all the prophecies made in this column, is certainly growing in Wisconsin. "Marshfield brick and tile made in Marshfield" will soon be the selling slogan of the Marshfield Brick & Tile Company. At a meeting of the stockholders held last week it was decided to increase the capital stock, the money to be used for new equipment and machinery, such as a clay feeder and mixer combined, conveyor, crusher for hard clay, two large down-draft kilns and an eight-tunnel instead of a four-tunnel dryer. The capacity of the plant will be increased by 50 per cent. In addition to these improvements, a boarding house for the superintendent and workmen will be built on the grounds.

The West Allis plant of the Milwaukee Pottery Company is running day and night. The potters are busy in the daytime, and their work is kept in the kilns both day and night until perfectly turned.

The Burlington Brick & Tile Company, Burlington, recently began operation for the season at its large factory in that city. "The prospects are good for a busy time," said an officer of the company.

Zerrenner Brothers, the enterprising brick manufacturers of New London, are erecting a fifty-foot tower at their brick yards. A water tank of 5,000-gallon capacity will be built to surmount the structure, and will serve as a protection against the ravages of fire.

Announcing that prospects are good for a real active year and that orders are considerably heavier than they were last year at this time, J. D. Pratt, representing the Wisconsin Red Pressed Brick Company, Menominee, recently visited Chicago and New York, preparatory to the big run for the season at the Menominee yards.

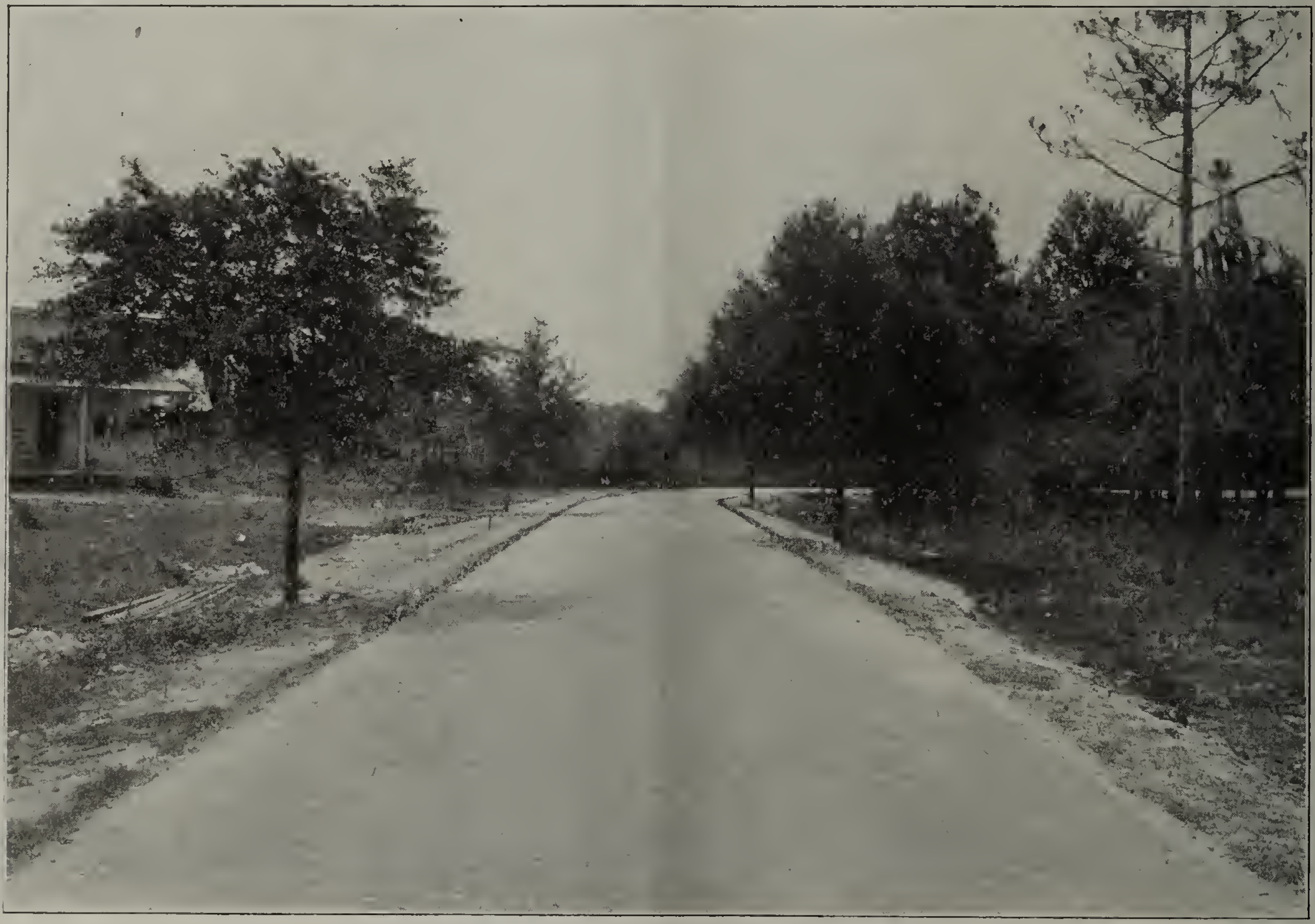
The Whitewater Brick & Tile Company, Whitewater, has more orders for its superior drain tile than it can fill. Every effort is being made to hurry the construction of four more kilns, which would treble the capacity of the plant. The new building, however, is being held up by delay in the arrival of bricks.

The estate of the late William E. Langenberg, pioneer brick manufacturer of Stevens Point, totals $50,000, according to latest inventory. In county court Mrs. W. E. Langenberg was recently appointed administratrix.

The Harbison-Walker Refractories Company, of Pittsburgh, has secured rights to quarry the rock on the farm formerly owned by Henry S. Erswell, near La Rue, and will open a quarry there for the mining of quartzite to be used in the manufacture of fire brick. The place is known as Rattlesnake Den, and is near Baraboo, Wis.

The committee on streets of Stevens Points recently met at the city offices and authorized a contract with the Macomb Sewer Pipe Company, of Macomb, Ill., for the season's supply of pipe. A regular schedule of prices has been fixed for the pipe, which will be of various sizes. Although another company offered the commodity at the same price, the committee awarded the contract to the Macomb Company without hesitation. The city of Stevens Point has dealt satisfactorily with the Macomb Company for the last four years.

A. BADGER.



Nebraska Ave., Sulphur Springs Road, Hillsboro County, Fla. Laid in 1913, Brick Laid Flat on Sand Base and Sand Filler.

Realism.

It was at the movies. An old couple sat together through a picture that included many views of the Wild West. In one of these a cattle "roundup" appeared, in which the dust rose in clouds from the parched ground. The old lady began to cough, and finally, when the neighbors began to fidget, her husband nudged her with his elbow. "Don't cough, Annie; can't you see you're disturbing the other folks?"

His wife looked at him apologetically over her handkerchief, smothering a spasm. "I can't help it, Ephraim. The dust tickles my throat."—Everybody's Magazine.

If some other states will follow the lead of Iowa by giving more co-operation in a study of ceramics, it will help develop a better knowledge of the clayworking industry.

Written for The Clay-Worker.

OPENING OF SEASON IN THE EAST.

ALL OVER THE EAST, yards are opening and operations are beginning upon as liberal a scale as the condition of the labor market permits. It must be admitted, however, that taking the whole eastern section together, labor is an item which will seriously interfere with manufacture this season unless something can be devised to furnish an adequate supply.

The mobilization of laborers in all localities for the purpose of increasing the cultivable area of land will seriously affect the yards in some instances, since it is the laborers who might be induced to work in these yards who will be most attracted by the farming propositions. Then, too, a possibility exists that the government will permit foreign army officers to come here and recruit from among the immigrants. If that is done, the situation will become even more acute. Many of the employes of the yards are foreign.

The experiment tried last year of bringing negroes from the South is to be repeated, but even that is not likely to succeed since they are needed at home to help maintain the productivity of the southern fields at their maximum. However the problem is viewed, the situation offers little indication of satisfactory solution unless other conditions change materially shortly.

Meanwhile, the outlook for business is better than for years. A few large building projects in New York are held up pending the outcome of the war, but in the main the development is to continue, regardless of the conditions existing. Investors believe that the situation warrants no restriction in this direction and they look forward to a business development of unprecedented magnitude as soon as the immense sums to be expended from the war loan begin to circulate.

Along the Hudson the yards are opening. They are short of help, but are doing the best they can. Brick are worth about $10.00 to $10.25, and the tendency is upward rather than downward. Shipments coming down the river are distributed as soon as they arrive and the supply is hardly sufficient to keep the buildings now under way moving. Labor difficulties failed to materialize the first of May, though some adjustments were made and the operations are continuing without interruption.

In the Hackensack district operations are proceeding upon a somewhat conservative scale. A few yards have sent out their first burnings and others have their drying yards already filled. But not all are yet in operation, and one or two may not start at all this season. The labor question is too serious to be ignored, and without labor work is impossible. The price paid is around $10.00, variations up or down being due to the negotiations between buyers and sellers.

About Newark requirements are large. Building operations are going forward upon a very large scale this season, but the brick supply is small, relatively, and under present circumstances it is difficult to imagine where they are coming from. The outlook is not promising at the moment. No large yards are located near Newark, and it is forced to draw its supplies from a considerable distance, therefore, it is not always the conditions that prevail at home that govern its supply.

The Raritan district is in active operation and most of the yards are working at capacity. Prices range from $9.75 to $10.25, depending upon the quantity wanted and buyer and seller. But the available supply is small and unless the weather permits operations to continue at a higher rate of speed than it has thus far this spring, the possibility of satisfying demand is not as promising as buyers would like to see.

Architectural terra cotta is a feature of the business which promises better than ever before. Prices on these two varieties have been advanced, but this has not seemed to make any difference with their sale. Demand is quite as heavy and the outlook for further development is promising.

BURTON.

Eleventh Ave., South Birmingham, Ala., Eighteen Years Old, Concrete Base and Grout Filler—No Repairs Needed.

BUTTONHOLE TALKS

SOME EXPERIENCES IN AN ANCIENT METROPOLIS.

I AM sitting right out in the open on Main street in what I believe to be the oldest metropolis in the United States. Main street was the only street and was miles long, extending along the perpendicular cliff front which towered about 700 feet above and in many cases actually overhung. All this in the Rito del Frejoles, 37 miles out of Santa Fe. The canyon is 18 miles long—just a rift in the rock—and back of Main street on the opposite side from the northern side cliff there rushes a singing mountain brook. Yesterday we followed it to the lower end of the canyon, where it narrowed between sheer, precipitous rock walls, scarce ten feet apart, and gathered itself for its first jump of seventy-five feet, after which, and with but slight pause, it took another of eighty-five feet and then joined the Rio Grande. To get there we had to climb rocky slopes that would have frightened me earlier in the week, and even then had to quit on a hanging trail about fifty feet directly above the first falls, which, however, gave us view of the gorge below.

W. D. Gates.

Have been here a week and there hasn't been a dull or idle moment. Have returned to the tent every night lame and tired from the day's climbing and have risen every morning feeling like a ten-year-old and ready and anxious for more climbing. Twice have we been to the wonderful Council Chamber, hewn in the face of a perpendicular cliff, one hundred and fifty feet up. Dizzily, along ledges and up ladders, we reached it and sat and reveled in fancy. Here there gathered the wisest of them to discuss ways and means, before Columbus thought of the new world, and, even then, it was most likely that it was old, and indeed it is not unlikely that the wise men of this place sat here at council at the time that those other wise men of the East saw the star and sought the infant Jesus. The cavern has been restored, but not ruined. The Kiva has been dug out and covered as originally. The ladder still extends down into it, as in times remote. Only the wood and perishables have been restored, and all the rest is left just as the hands that have been dust for centuries left them. Those who dug the cave, those who met here in solemn conclave, all their mysterious rites, all their history, have gone, but this actual work of their hands, this visible evidence remains.

This forenoon we went up the old trail at the lower end of the canyon. Climbing up and up, we followed it, worn deep in the soft rock by the moccasined feet of generations of the old inhabitants. Finally we came to rocky zigzags, where, still showing plainly in places, were the steps cut in the rock to accommodate the commerce of long ago. There were hundreds of them. I mean hundreds; possibly a thousand, for time has eroded, the waters have washed, and much is gone, still you can pick them up in spaces here and there, and they show that they were worn deep by the moccasined feet of the people of the long ago. All the country hereabout is dotted with prehistoric remains, but this was the metropolis, so up and down they journeyed, and the old-time Commissioner of Streets did his duty and made the road usable for them, the best he could, and his work remains to this day to show his efficiency.

Right opposite me as I write there show plainly on the face of the cliff, bright in the sun on the southern exposure of the north cliff (for these people were devotees of sunshine and evidently reveled in it) what was the aristocratic, high-class upper ten residence district. The rooms show clear and distinct, cut out in the soft volcanic rock, and extend three and four stories high, while the rock rooms were built out on the lower floor, connecting with these cave rooms. Such remains extend along the base of the cliff for miles, while the balance of the more level parts of the bottom of the canyon are littered with remains of the former inhabitants. A little below are the excavated remains of the Community House of some 230 rooms on the ground floor alone. There is a large Kiva near this, also other smaller Community Houses and Kivas eastward and a very mysterious circular platform, some forty or fifty feet in diameter, all paved with stone, the purpose of which cannot be fathomed. Guesses as to the number of inhabitants formerly here vary much, running from 15,000 to 50,000.

I cannot get over the idea that these cave dwellings were the very earliest habitation of man. The rocks here, many of them have natural caves. All the animal instincts of early man would have tended to his taking the best natural shelter, just as do the wild animals, and thus making his home in one of these natural caverns. Then, finding the cliffs composed of soft, easily wrought rock, he would turn to digging his cave as he wanted it and where he wanted it, and the sunny, warm side of the cliff afforded him just what he wanted, and it also afforded him protection, hidden as it was in the bottom of the gorge and only one steep, obscure trail leading to it.

Then as the community grew they learned to build, roughly shaping the thousands of stone blocks seen here all about, and building them additional rooms outside the caves and later on the different Community Houses, ruins of which abound on every side, many of which are as yet unexcavated.

They were an agricultural people, as is well shown by the immense number of their grinding stones left in the ruins, and the evident fact that the stones were well worn. These and the shreds of broken pottery are indeed about all that is left to show of their domestic habits, coupled with the absence of spear and arrow heads, not one of which have we found, notwithstanding that we have kept an eye out for them all the time.

I have always had a fancy for the haunts of the dead ones, for rummaging in the homes of the ancients, have planted my feet in the paths that Moses trod in Egypt, have stood in the path that the gladiators trod in the Coliseum at Rome, and today when I put my feet in those worn steps of the old trail I could but feel that I was in contact wtih something more ancient as well as holding more of interest to an American than the others could possibly hold.

This place is indeed old. It should be sacred to an American. The ruins about in the surrounding country are innumerable and of the greatest antiquity, while this particular place was, beyond question, the metropolis of that time. It will become the Mecca for the American as soon as it becomes more widely known.

In fancy I look across Main street there and repopulate those wrecked and deserted homes. I hear the thud of their flinty axes as they cut new rooms to enlarge their quarters in those, their flats. The mothers are at their grinding stones, while the daughters are doing up their hair in killing shape for the beau who will drop in later. The papooses are playing everywhere and are everywhere in evidence and multiply in number. The grim old patriarchs are braiding their white locks and placing the red feathers preparatory to a climb to the Council Chamber, to there settle matters of state.

The young beau is busy manicuring his finger and toe nails preparatory to a visit to his adored and her ma. According to tradition, as well as immemorial custom down to the present time in the Pueblos here, the mother is the whole thing in all the home matters. It will be her he will go to to ask her daughter's hand, and, if he be successful in his suit, it will be her name he will take when he adjusts the mystic ring, and he will be annexed to his bride's family, and not she to his. He has already, in imagination, located the new cave annex to her flat, and his attentions to ma have only been secondary to those extended by him to his Geraldine. He appears nervous tonight, for he has heard that a dude named Percy has just come into the Metropolis from a distant canyon, and he is fearful that he may have intentions on his own dear love, and, you know, these strangers from the outside are very fetching and, really, you know it is mighty fortunate that I can now work all this out in my imagination, for I realize that had I made this visit a few hundred years ago and then had taken my seat here on Main street, I probably wouldn't have had much chance to moralize as I am now doing, but would have had the entire aggregation on my hands and would have had the personal attention of the entire city. I feel that, for the once, I would have had too much attention, been surfeited with it, as it were.

Our cities may not now be so shut in as was this city of the remote past, but our cares are much like theirs, our wants really just like their wants, our joys like their joys, our sorrows like their sorrows, and our coming and going like theirs. Living and dying are the same in all times. Hunger and thirst, loving and mourning, sleeping and waking, laughing and crying, all may vary in intensity, but they are present in all lives and in all ages. Their cares and troubles, their joys and sorrows were just as personal as are ours. Their entrance into life and their departure therefrom were just as certain, just as real, just as personal, and just as important to them as they are personal and important to us today. All these mattered much to them then, were of vital and pressing moment, just as they are to us today, and, it may well be, that a thousand years hence archaeologists may be digging on our lake front, in the ashes and brickbats and soot we have there dumped, and wondering as to what we were and who we were and what manner of civilization we cultivated. It does us good to pause and look back at times to something of this kind. To look to the ruins and all that remains of a big city of the long ago and to see how very little remains after it is all over. That the pressing cares of the present that seem of such overwhelming importance really mean so very little in the immensity of the mill of time. They show us how very little is the greatest among us; how meager are the biggest of our personal matters as compared with the infinite matters of the universe. That just as a second of time is to a century so is the little ripple of our life in the great ocean of infinity, and it tends to bring us to our senses and stop us from swelling up with our own little importance and come down to the earth and try to conduct our little personal matters on a just and proper scale and to get on livable and friendly terms with our own personal and reliable conscience.

This canyon could hold just as much joy and sorrow as could the biggest city or the biggest prairie of today. Rocky walls will not shut them in or shut them out. No barriers will stop or hinder them. Personal attention can do much with them to regulate and control, but physical barriers are of no avail to hold or hinder them. And so these rocky walls have had generation after generation in their keeping. One after another they have here been born, have lived and died, and there is now nothing to tell of their having so lived but these caves and ruins and the multitude of sherds of broken pottery. These fragments are, naturally, very interesting to me and command my attention.

We came here expecting to find very much of interest in the matter of the ruins of a remote past. Of this we found much more than we had hope and that, too, of a very much more interesting character. But the one thing that we had no dream of finding, and which was more charming and more rare, was Judge and Mrs. Abbott living their lives in the bottom of this gorge, with a personality and lovable character so charming that the meeting them alone is worth all the trip. Just a glimpse of their life, so quiet, so unassuming, so full of all that is good and wholesome and pure, so content in the companionship of their books and their communion with Nature in all her subtle moods, the picture we carry away with us will often recur in the future and will always do us good and make us better citizens, more content, happier, glad that we lived to come here and meet them and had them make an impress on our lives.

We have walked thirty-five miles here in the canyon in the week we have been here, and the pedometer only registers horizontal distance, and most of ours has been up and down. It is all climbing or descending—there are no levels here.

GATES.

BRICK CONTRACTORS.

Incidents happening in the trade now and then have given rise to this question do we need more men trained in the art of brick contracting? The brick industry has given much thought, time and money to the training of young men for the work of laying brick, and they have still room for further effort along this line with good results. Meantime what about the brick contracting business?

In one city of fair size, where a suggestion was made that the brick men secure the co-operation of brick contractors in a campaign of advertising, the brick men complained that there were but few contractors worth while, that is contractors engaged exclusively in the brick business. It seems that many of the contracts taken for brick work were taken by lumbermen and carpenter contractors, who simply sublet the brick work to brick layers.

Some further inquiry developed the fact that almost any carpenter contractor gives quite a lot of his time and attention to the matter of estimating, making plans and interpreting plans, to rendering assistance in many ways to the prospective builder, whereas too many of the so-called brick contractors are nothing more nor less than brick layers, know but little about the science of estimating, and are not able to render much assistance to the prospective builder in the work of shaping the details of his plans and choosing designs for his building.

It is not only possible, but seemingly very likely, that the trade has been overlooking something here which needs active attention, and that is a matter of encouraging the development in every practical way of more people qualified to do brick contracting. It is plainly evident that contractors in wood construction are not only more abundant in numbers, but they are more efficient in many ways, better qualified with the information about the details of construction, and are in a position to render more service generally to the prospective builder than brick contractors are.

Plainly there is room for the mobilizing and training of an industrial army in the division of brick contractors.

FINANCING A NEW INDIANA CLAY PLANT.

Roy E. Gaines, of Dale, Spencer county, Indiana, has been busy during the past few weeks soliciting subscriptions for the Southern Indiana Clay Products Co. This is a new enterprise which has been promoted by Mr. Gaines and H. F. Lobby, a well-known business man of Winslow, Ind. There is an abundance of shale and fire clay of superior quality around Dale, it is said, and it is the intention of the company to build a $75,000 plant in Dale this summer that will manufacture building brick, roofing tile and fire proofing blocks. The company now owns and operates the Patoka Brick Co., at Huntingburg, Ind., and it also has an option on the other brick plant in Huntingburg. The two Huntingburg plants have a combined capacity of 80,000 brick per day and are now being operated at full capacity. The Southern Indiana Clay Products Co. is a state corporation and has a capital stock of $600,000, of which sum $300,000 is preferred stock. Charles Moenkhaus, of Huntingburg, is the president of the company and W. G. Smith, of Indianapolis, is the fiscal agent.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART XII.

Calorific Determinations.

THE determination of calorific values in kiln operations can be best illustrated by a concrete example. The average analysis of a Hocking Valley (Ohio) coal as given by Somermeier in "Coal" is as follows:

	Per Cent.	Pounds.
H.	5.43	.0543
C.	69.03	.6903
N.	1.26	.0126
O.	13.62	.1362
S.	3.30	.0330
Ash	7.36	.0736

The heat value in this coal in B.t.u., according to Dulong's formula, is:

$$14544\times.6658+62028\ (.0543-.0158)+4050\times.0297=12192.$$

If we assume that 25 per cent. of the kiln ash is carbon, the total ash will be 9.81 per cent., of which 2.45 per cent. is carbon, leaving 66.58 per cent. of carbon for combustion.

If 10 per cent. of the sulphur remains in the ash, we have 2.97 per cent. remaining for combustion.

The above adjustments give us the following data:

H. = .0543 pound
C. = .6658 pound
N. = .0126 pound
O. = .1362 pound
S. = .0297 pound
Ash = .1014 pound

1.0000 pound

The oxygen will combine with the hydrogen to form water vapor in the proportions of

$$2/16=\frac{X}{.1362}$$

from which we determine X to be .017, making the water vapor from this source .1362+.017=.1532. There remains .0373 H., which will combine with oxygen from the air, and which will require .0373×8=.2984 oxygen, and produces .0373+.2984=.3357 water vapor.

The total water vapor from the coal is, therefore, .1532+.3357=.4889 pounds.

The carbon burns to CO_2 if the combustion is complete, and it will require oxygen from the air in the ratio of

$$12/32=\frac{X}{.6658}$$

from which we determine X to be 1.7755 and the CO_2 is 2.4413 pounds. The sulphur burns to SO_2 and requires an equal amount of air, or .0297 pounds, and develops .0594 pounds SO_2. The total oxygen from the air for the several reactions is 2.1036 pounds, and this carries with it 7.005 pounds of nitrogen.

We have, then, as products of complete combustion:

Water vapor	.4889 pound
CO_2	2.4413 pounds
SO_2	.0594 pound
N in coal	.0126 pound
N from air	7.0050 pounds

The total air required is 9.1086 pounds, exclusive of any moisture in the air.

In 9.1086 pounds of air at an assumed temperature of 80 degrees F. and 80 per cent. humidity, there will be approximately .16 pound of moisture (see Kent, page 551), which must be added to the moisture from the coal, thus increasing the water vapor to .6489 pound.

In down draft kilns under full fire, the temperature of the gases is that of a red heat—let us assume 1432 degrees F.

From the above data and the table of Thermal Capacities we determine the heat carried out of the kiln by the waste gases as follows:

$$.6489\times784=508.7\text{ B. t. u.}$$
$$2.4413\times384=937.5\text{ B. t. u.}$$
$$.0524\times285=16.9\text{ B: t. u.}$$
$$7.0176\times360=2526.3\text{ B. t. u.}$$

3389.4 B. t. u.

We have stated that the oxygen in the coal combines with hydrogen to form water, but in fact it undoubtedly is already in such combination, and we must consider as a loss the conversion of this water into vapor. .1532×970=148.6 B. t. u., the latent heat of the vapor, which, added to the above, gives a total stack loss of 4138 B. t. u. per pound of coal.

The total heat value of the available combustibles in the fuel is 12192 B. t. u. and the heat losses in the gases are therefore 34 per cent. Many kiln operations are conducted with the exact requirement of air, upon which basis the above problem is figured. One factory record, during a test of three hours, shows an average of 216 per cent. excess of air. The excess varied from 25 per cent. to 660 per cent. These records are not unusual, and the average in many plants will not be less than 100 per cent. excess air, although it should not exceed 50 per cent. with proper furnace construction under reasonably good operation. In some operations the air is reduced practically to the theoretical requirement, otherwise it would not be possible to burn some lines of high temperature ware.

In the preceding problem the theoretical amount of air is 9.1086 pounds, carrying .16 pound of moisture. One hundred per cent. excess air would carry 3346 B. t. u. out of the stack, which would be 27 per cent. of the fuel value, making a total loss of 61 per cent., and 200 per cent. excess air brings the total loss to 88 per cent. Bleininger's tests show an average loss of 31.7 per cent. in the fuel gases. The stack losses which we show are high because we have assumed a high stack temperature, but we get stack temperatures approximating this degree in multiple stack kilns where the stack is built into the kiln wall, and in such kilns the heat lost by absorption will be relatively less.

If the stack is some distance from the kiln and the gases are cooled to 600 or 800 degrees, the stack loss will be correspondingly less, but the kiln absorption will be greater.

Illustration No. 12 shows the stack losses in per cents. for the theoretical air requirement and for 100 per cent. excess air.

If we are making a heat balance of the kiln operation we should include the thermal capacity of the air entering the furnaces, adding it to the heat development or deducting it from the stack losses, which would make a correction of about 1 per cent. for each 100 per cent. of air.

As has been stated, the air entering the grates burn the carbon to CO_2, and as this rises through the coals it is reduced to CO, which burns to CO_2 when it comes in contact with the secondary air.

If the air volume is insufficient, the stack gases will contain both CO and CO_2. In making a calculation for such a condition, we first estimate the volume of CO and determine the amount of air entering into it. The remaining air supply will convert part of the CO into CO_2.

Assume that the air supply is 80 per cent., which would give:

2.1036 × .80 = 1.6828 pounds oxygen
7.026 × .80 = 5.6044 pounds nitrogen
.16 × .80 = .128 pounds moisture

We must first satisfy the hydrogen and sulphur. Hydrogen requires 8 pounds of oxygen per pound of hydrogen, and since there was .0373 pound of hydrogen unsatisfied, we must allow for it .2984 pound of oxygen. The .0297 pound of sulphur requires .0297 pound of oxygen. The total oxygen for hydrogen and sulphur is .2984 + .0297 = .3281 pound, leaving (1.6828 — .3281) 1.3547 pounds of oxygen for the carbon. The carbon first burns to CO, which requires ¾ = .6658 ×, from which we find × to be .8877 oxygen, leaving (1.3547 — .8877) .467 oxygen available to burn CO to CO_2. The CO thus formed is 1.5535 pounds. The CO which can be burned by .467 pound of oxygen will be as 28/16 = × .467, from which × is found to be .8173. Gathering the results together, we have:

$.0373\ H + .2984\ O = .3357\ H_2O$
$.0297\ S + .0297\ O = .0594\ SO_2$
$1.5535\ CO - .8173\ CO = .7362\ CO$
$.9173\ CO + .467\ O = 1.2843\ CO_2$

Total = 2.4156 pounds

Combustion products = 2.4156
Nitrogen = 5.6044
Moisture from coal = .1532
Moisture from air = .1280

Total stack gases, 8.3012

The calorific determination is the same as for complete combustion, and is as follows:

$.6179\ H_2O \times 784 = 484.4$ B.t.u.
$.0594\ SO_2 \times 285 = 16.9$ B.t.u.
$.7362\ CO \times 360 = 265.0$ B.t.u.
$1.2843\ CO_2 \times 384 = 493.2$ B.t.u.
$5.6044\ N \times 360 = 2017.6$ B.t.u.

3277.1 B.t.u.
Latent heat water vapor 118.9 B.t.u.

Total 3396 B.t.u.

This is 28 per cent. of the total fuel value of the coal.

Less than the theoretical per cent. of air reduces the stack losses, but on the other hand we do not get the full heat value of the fuel. We have .7362 pound of unburned CO, which would give 3209 B. t. u., about 23 per cent. of which is offset in the lessened stack loss. As has been previously pointed out, if we wish high temperatures, regardless of the reducing effect of the kiln gases, it is better to err on the side of less than the theoretical amount of air than on the side of excess air up to a difference of 20 to 30 per cent. from the theoretical amount.

The stack gases from continuous kilns which escape at temperatures under 400 degrees involve relatively small losses and it has been common practice to use a large excess of air in such kiln.

Originally, continuous kilns had no advanced heating flues for the water-smoking, and, in view of the small quantity of fuel burned and in consequence the relatively small volume of combustion gases in connection with the low final temperature, it was necessary to introduce an excess of air in order to remove the moisture and thus keep the water-smoking compartments in step with the burning compartment. Modern continuous kilns are provided with advance heating flues controlled by an independent stack or fan, and there is no reason why any great excess of air need be carried through the combustion compartments.

Carbon-Dioxide in Combustion Gases.

The volumes of oxygen and nitrogen in the air are very closely 21 per cent. of the former and 79 per cent. of the latter.

If we were burning pure carbon with the theoretical amount of air, the stack gases would contain 21 per cent. volume carbon-dioxide and 79 per cent. volume nitrogen, but in the combustion gases from impure coals the carbon-dioxide is always less than 21 per cent. For example, in perfect combustion of the coal in question, the CO_2 in the combustion gases would be 16.4 per cent., including the moisture shown, or including only the amount of moisture which would be present in a sample of the gas at 62 degrees F., the CO_2 would be 17.7 per cent. Any analysis showing materially less CO_2 and at the same time free oxygen is evidence of excess air, and the amount of the excess may be readily calculated. If the gases shown CO_2 and CO with no oxygen, or only a trace, the combustion is not complete through lack of air.

Under the assumption of 200 per cent. excess of air there will be 5.6 per cent. of CO_2 in the gases.

The following table shows the percentage of carbon-dioxide which the kiln gases from an Illinois coal will contain under the various percentages of air:

Air.	CO_2	Air.	CO_2
100%	15.9	160%	10.2
110%	14.5	170%	9.6
120%	13.4	180%	9.1
130%	12.4	190%	8.6
140%	11.6	200%	8.2
150%	10.8	300%	5.5

Under certain conditions of temperature and pressure (32 degrees F. and 29.92 inches pressure) the volumes of perfect gases are inversely proportional to the molecular weights and the imperfect gases, particularly CO_2, may also be included, because the error introduced in so considering them is slight in comparison with the errors in an ordinary gas analysis.

(Note:—The analytical work as usually conducted in clay-working factories is only an approximation of the actual composition of the kiln gases. The average operator who sticks an iron pipe into a stack and collects the gas over water, who is careless in connecting the apparatus and who pays no attention to the temperature and pressure changes, is only making a good guess of the composition of the gas, but if the combustion is widely varying from perfect combustion, a good guess will lead to more economical operation, and is therefore recommended.)

Two unit weights of hydrogen, 28 of nitrogen, 28 of carbon-monoxide, 44 (approximately) of carbon-dioxide, 64 (approximately) of sulphur-dioxide, 18 of water vapor, 16 of methane, 28 of ethelene, have the same unit volume. Having the weights of the combustion gases, we determine the relative volumes by dividing the molecular weights, and from these we get the per cent. volumes, such as would be determined in a gas analysis apparatus. In this way we get the 16.4 per cent. carbon-dioxide in the combustion gases under consideration, and similarly were the results in the above table determined.

Radiation Losses.

The radiation losses are much higher than the average clayworker suspects, and if he could actually see the loss going on, he would take steps to reduce it to a minimum. He sees the coal being shoveled into the furnace and the dwindling coal pile, but these are necessary factors in burning the ware.

Bleininger's tests of industrial kilns show an average of 53.7 per cent. of the fuel value, taken up by the kiln and lost by radiation. Unfortunately, there is no data relative to the actual radiation loss, and we can only approximate it by an assumption of the heat taken up by the kiln. An average kiln will have in its walls as many tons of brick work as the tonnage capacity of the kiln, if filled with bricks, and the average heat taken up by the walls would be roughly one-half, since the outer surface of the kiln walls are scarcely hotter than the atmosphere, while the inner walls have the kiln temperature. Two brick kilns tested by Bleininger have an average of 15.4 per cent. of the heat taken up by the ware, and on the above assumption the kiln walls will take up less than 8 per cent.

We realize that the data is very insufficient, but it points to the probability that the average radiation kiln loss is at least 40 per cent., except when the fires are being crowded to obtain final temperatures, during which period a maximum quantity of fuel is being burned.

(To Be Continued.)

BRICKMAKING IN RUSSIA

Interesting Facts Concerning the Clayworking Industries of the Great Empire Now So Conspicuous in the World's Affairs

BUILDING IN RUSSIA is not so diffeernt from what it is in other countries," says Mr. A. Kahn, a native Russian, now manager of the Russ-Manufacturers and Merchants' Exchange, located in New York. "The variation is as wide there as it is elsewhere in the world, and the same steady improvement in housing is noted which prevails elsewhere. Aside from this, perhaps, the conditions may be different in that up to the time of the war, and the recent overturn, Russia has been somewhat slow in development, largely because a great portion of its people are peasants whose incomes are necessarily small and who have never enjoyed an opportunity to develop as the workingmen have in this country, in France, in England, and other countries where liberal governmental ideas prevail.

"So far as building is concerned all materials are used, beginning with the peasant's hut made of logs, chinked with earth and sometimes plastered with mud on the inside, to the great palaces of beautifully chiseled stone. The middle class live in houses built of wood, much as the same class do in this country. The wealthy have their magnificent mansions of brick and terra cotta, or stone, many of them highly ornamented, as befits the Oriental tendency which is a marked characteristic of Russian life. And the numberless variations between the extremes are worked out much as they are worked out elsewhere. I cannot see that any material difference exists. Perhaps the poorer people devote less attention to their homes than the same relative classes do elsewhere, but the middle class are substantially the same.

"Brick is made extensively in Russia, and some progress is noted in the making of architectural terra cotta. It has not gone as far as it has in America, but it is developing and ultimately it will reach a high level. Ornamentation is a striking characteristic of the work of Russians, no matter what they undertake, and beautiful architectural terra cotta will result from the development now going on in that material.

"Brick has been made in Russia from time immemorial, and it is made there now in steadily increasing quantities. All grades are made, though, of course, the common brick, which is not as handsome as the average common brick in this country, leads the output. I couldn't even guess how many are turned out in a year, but I know it must be very large. Plenty of clay exists for making the best qualities, and plants near the large cities are constantly busy.

"The cities are brick built. In that they do not vary so much from cities in this country. While Russia has no cities which equal the great ones of America, France and England, she has a number which are growing very fast, and the requirements are steadily increasing. Such work is expanding steadily, and as the general tendency for improvement becomes more and more marked the necessities are larger and ultimately the output will be double what it is today.

"In a general sense it is a matter of recent development that the buildings made of brick are in modern style. Formerly they were plain, but recent years architects have traveled and have seen what wonderful things are done here and elsewhere with burned clay, and the influence is already manifest. To some extent, American ideas are the basis of this development, but the number of Russians who come here to study architecture is limited compared with those who visit European cities. Some types of burned clay architecture have developed farther in Europe than they have here, but the more modern uses of burned clay must be learned here.

"Dried mud was the first brick made by the Russian. I couldn't say when he learned the art of burning. Since it is more or less of a primitive art, I assume that he learned it long ago. Many peoples knew that art even before they understood laying up the resulting material in the artistic forms which are the attractive features of its use. From the earliest times something has been done. I suppose ruins of plain mud huts can still be found where the first attempts at brickmaking can be seen studied. This holds good in all other lands, and I see no reason to doubt it in my own.

"It is only during the past half century that the embellished forms of burned clay have been used extensively. And the Oriental character in the Russian teaches him to make his embellishments as elaborate and ornate as possible. He has reproduced in burned clay in some instances reasonably good copies of the marvelous carvings of other Oriental peoples. Not always, to be sure, yet often enough to indicate what he is capable of doing under a fostering influence which will encourage him to work out his artistic ideas in this plastic material.

"No competition from cement is feared since cement is imported, and it is necessarily more expensive than brick. Maybe that assertion will have to be modified now, but it is true enough to hold, even though something may have been done in making it at home. So far as I am aware, however, nothing is done in that direction. Imports have not been so heavy these last few years, but after the war is over and the development of all business enterprise begins, it is probably true that cement will be used more freely, and perhaps it will become a serious competitor of burned clay.

"In many instances brickmaking is by the most primitive tools and machinery. Where machinery has been bought, it has generally been in Germany. It is true that Germany has dominated the business situation, and German capital has furnished all the money for any development at all. And this has held good in respect to this business the same as others. I can't speak definitely about it, because I am not familiar with the details, but knowing that Germany has dominated all else, I feel confident that it has taken everything procurable in this, too. It is one of the influences against which the rest of the world will have to guard if any other country hopes to obtain a share of the wonderful business opportunities lying idle in Russia, waiting for some enterprising nation to enter and seize them. And seize is the word to use with reference to Germany. It has the mercantile machinery all there, disrupted somewhat by the war, but do not doubt for a moment that they will return after the war is over. Neither should Americans believe that sentiment is going to govern the development of business after the war. The Russian is going to buy everything he has to buy in the most favorable market, and unless Americans begin their work now and plan for the proper invasion of that territory they will have no part in the great development which is coming to that favored land.

"Brick manufacturers are hampered in some instances by lack of proper machinery with which to work economically, but unless American manufacturers introduce their machinery the Russian will know nothing about it. He is not much of a traveler, and when machines or any other goods are laid down at his doors as he wants them, by Germany, or England, or some one else, he will not come to America for his purchases, merely because America is a republic, and he is trying to make his country a republic, too. Something more substantial than sentiment will have to be invoked if the American manufacturer of any sort of machinery hopes to secure a share of the trade. In other words, he must go there and study the situation and make his machines or whatever else he wants to sell as the Russian wants them. He cannot hope to compete unless he does.

"It is a simple matter, after all. Studying the needs of the country and undertaking to assist the inhabitant in his development. But heretofore the American manufacturers have not seen fit to do the work in the right way, and their share has been very small in the great trade which has developed as the Russian peasant has developed. Germany, for example, has studied the market, and in a good many lines has furnished the goods better suited to the Russian needs than he could produce them in his own factories. And in many instances the Russian factories have been rented to Germans, who closed them, paying the rent on idle buildings and machinery, while they shipped goods made in their own factories, giving their people the work instead of the Russians. In the tremendous competition for world business which is coming after the war the German will resume his activities, and, having the commercial machinery ready at hand, with a full knowledge of the peculiarities of the Russian desires, he will secure the bulk of this business.

"I am confident that America, in brickmaking machinery, as in other articles and goods, could secure a liberal share of Russian trade if she chose to go after it in the proper way. But catalogs printed in English, or traveling men who merely know English, will never conquer that commercial territory. It is only the man who knows the Russian desires intimately and can appeal to their more or less picturesque sense who can succeed. Just as the peasant builds his mud hut in some picturesque way and then decorates it more or less elaborately, so does he display his natural characteristics in other ways. And these must be known if the seller of anything even as commonplace as clay machinery is going to succeed."

ANNOUNCEMENT OF SUMMER MEETING.

American Ceramic Society.

The committee in charge has completed preliminary plans for a summer session in southern and Central New York. The itinerary, tentative form, provides for assembling Monday, July 2, at 8 p. m., at Hornell, N. Y., for an evening session. Tuesday, a trip by stage to Alfred, to visit the New York State School of Clay Working and Ceramics, going later by train to Corning. A visit to a glass plant will be made Tuesday evening. Wednesday will be spent in Corning, visiting glass, terra cotta and clay plants. Go to Geneva, N. Y., in the evening. Thursday, go to Canandaigua, Victor and Rochester, visiting brick, electric porcelain and enameling plants. Friday, visit plants at Rochester, Charlotte and vicinity, disbanding at close of the day, July 6.

The committee hopes that by this early notice, it may be possible for members to arrange their vacation dates so as to take part in this trip. A later and more detailed announcement will be sent.

EDWARD ORTON, JR., Secretary.

Columbus, Ohio, May 10, 1917.

AMERICAN CERAMIC SOCIETY ORGANIZES COMMITTEE ON MILITARY PREPAREDNESS.

THE AMERICAN CERAMIC SOCIETY at its annual meeting held in New York, March 5th to 8th, authorized the formation of a Committee on Military and Economic Preparedness, which has now been organized and has begun its activity. The Committee has offered its services to the National Defense Council and the National Research Council.

This Society devotes itself to the study of the chemistry and engineering of the silicate industries, embracing the manufacture of clay products, glass, cements, and other cognate lines like the manufacture of abrasive wheels, the enameling of metals, etc. It does not deal with the artistic or historical phases as the name alone might lead one to infer. In its membership it has many of the leading specialists in the country, all of whom are eager to serve the country in this crisis. A census has been taken of the membership with a view to showing the number of firms and specialists available in each sub-division of the field, which have military significance.

Up to the present time eight divisions have been created which embrace in their membership leading manufacturers and technical men. The personnel of the Committee is as follows:

Edward Orton, Jr., Chairman, Ohio State University, Columbus, O.

A. V. Bleininger, Vice-Chairman, Bureau of Standards, Pitsburgh, Pa.

Divisions and Chairmen of Sub-Committees:

Abrasives—R. C. Purdy, Norton Company, Worcester, Mass.

Chemical Stone Ware—R. H. Minton, Metuchen, N. J.

Enameled Iron and Steel—R. D. Landrum, Harshaw, Fuller & Goodwin Co., Cleveland, O.

Glass for Optical Purposes—C. H. Kerr, American Optical Co., Southbridge, Mass.

Hydraulic Cements—P. H. Bates, Bureau of Standards, Pittsburgh, Pa.

Porcelain, For Electrical Purposes, Spark Plugs, Etc.—L. E. Barringer, General Electric Co., Schenectady, N. Y.

Raw Materials for the Ceramic Industries—A. S. Watts, Ohio State University, Columbus, O.

Refractories—A. V. Bleininger, Bureau of Standards, Pittsburgh, Pa.

SAFETY IN BRICKMAKING

An Interesting, Graphic Story of Preventive Appliances for Use in the Brick Manufacturing Industry

AS A SUPPLEMENT to the American Industries, there was published in April a four-page leaflet on "Preventive Appliances" applying to the brick manufacturing industry, which we are privileged to give in part as follows:

"Since it is our function to deal rather with the reduction of the cost item than with its spectacular summary, the illustrations are presented herewith to tell their own story of removing hazards and preventing accidents due to unprotected equipment. The different examples selected show typical machines now in operation with the addition of guards and guarding devices necessary to make them comply with accepted safety standards, without interfering seriously with normal operation of the plant adopting these suggestions.

"For the manufacturer ordering new equipment, modern machine builders are supplying these machines with many of the guards here shown embodied in the original design so cleverly that the danger point is no longer obvious. Machines of this type should be demanded by buyers, realizing that the slight difference in original cost does not compare with the expense incurred in guarding after installation.

"Other phases of the problem which are more important than the equipment hazard in most plants are the building hazards and general housekeeping methods. Workmen are required to move barrows and trucks over poorly improvised floors and runways, when permanent concrete walks would be safer and cheaper in the long run.

"Natural light is often excluded from work rooms for no apparent reason and the pieces of equipment not arranged in accordance with sequence of operation, thereby making conditions that are directly opposed to efficiency and safety.

"But most conspicuous is the absence, in many plants, of educational literature and methods, and organized work to prevent accidents. In many plants these measures would be financed entirely by the insurance carrier, through the application of merit rating as used by compensation insurance carriers. An efficient organization with proper authority would provide the necessary mechanical preventive devices, and first aid equipment which, used properly, reduce appreciably both the total number and cost of all accidents, and also the cost and severity of those accidents that occur in spite of all human endeavor.

"A system for preventing the use of unsafe tools and appliances should be installed and defective appliances of all kinds should be repaired and maintained in good condition or discarded entirely. Good housekeeping, education and organi-

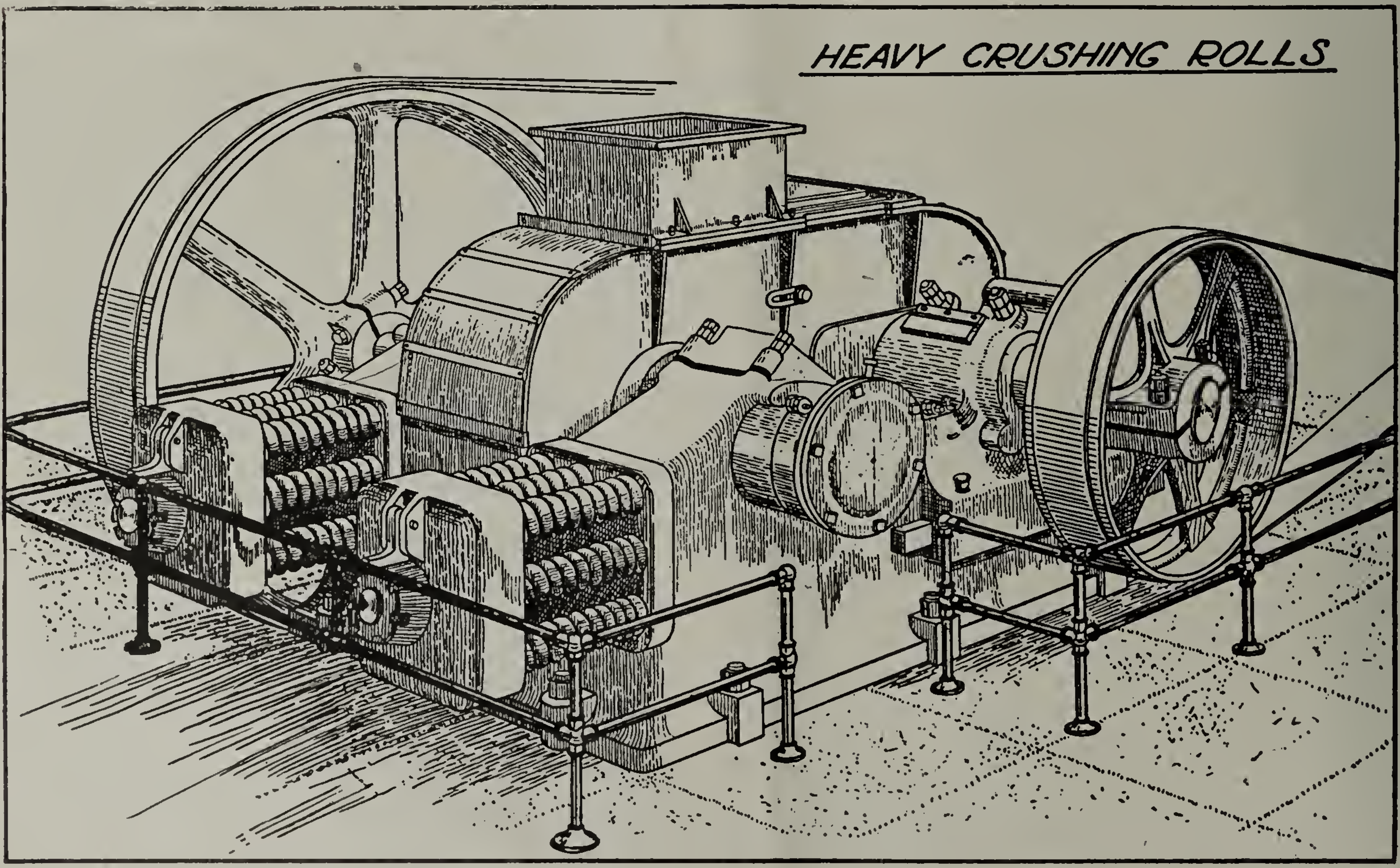


Figure 1. Heavy crushing rolls, showing the application of standard pipe railing to prevent accidental contact of workman with dangerous revolving or reciprocating or pinching parts and preventing passage between the upper and lower parts of horizontal belting.

Published by arrangement with Carl M. Hansen and the Universal Safety Standards Company, Philadelphia.

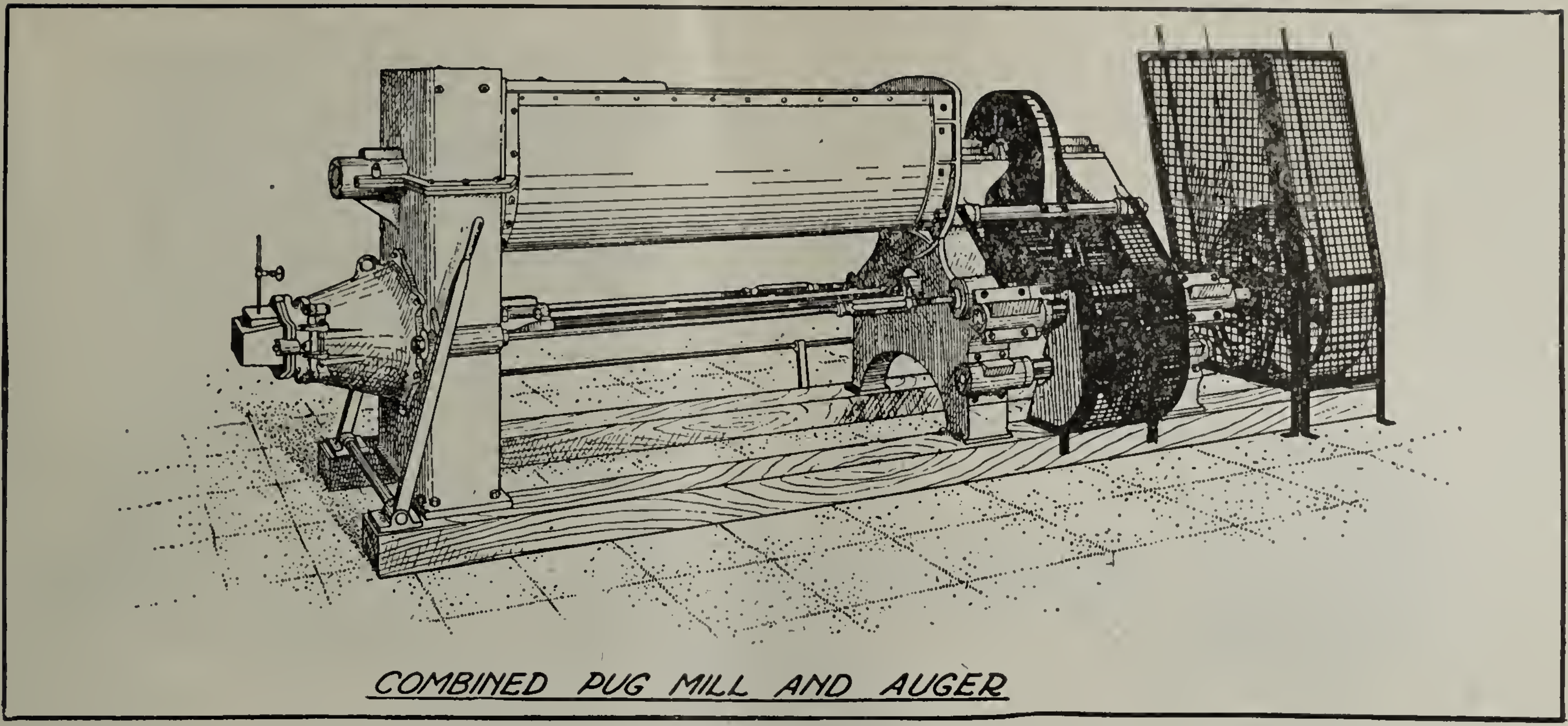


Figure 2. Combined pug mill and auger, with a driving belt, pulley and clutch and all gears and pinions and shafting enclosed in standard guards; starting and stopping levers located at the delivery end and with all necessary provision for repair maintenance and adjustment.

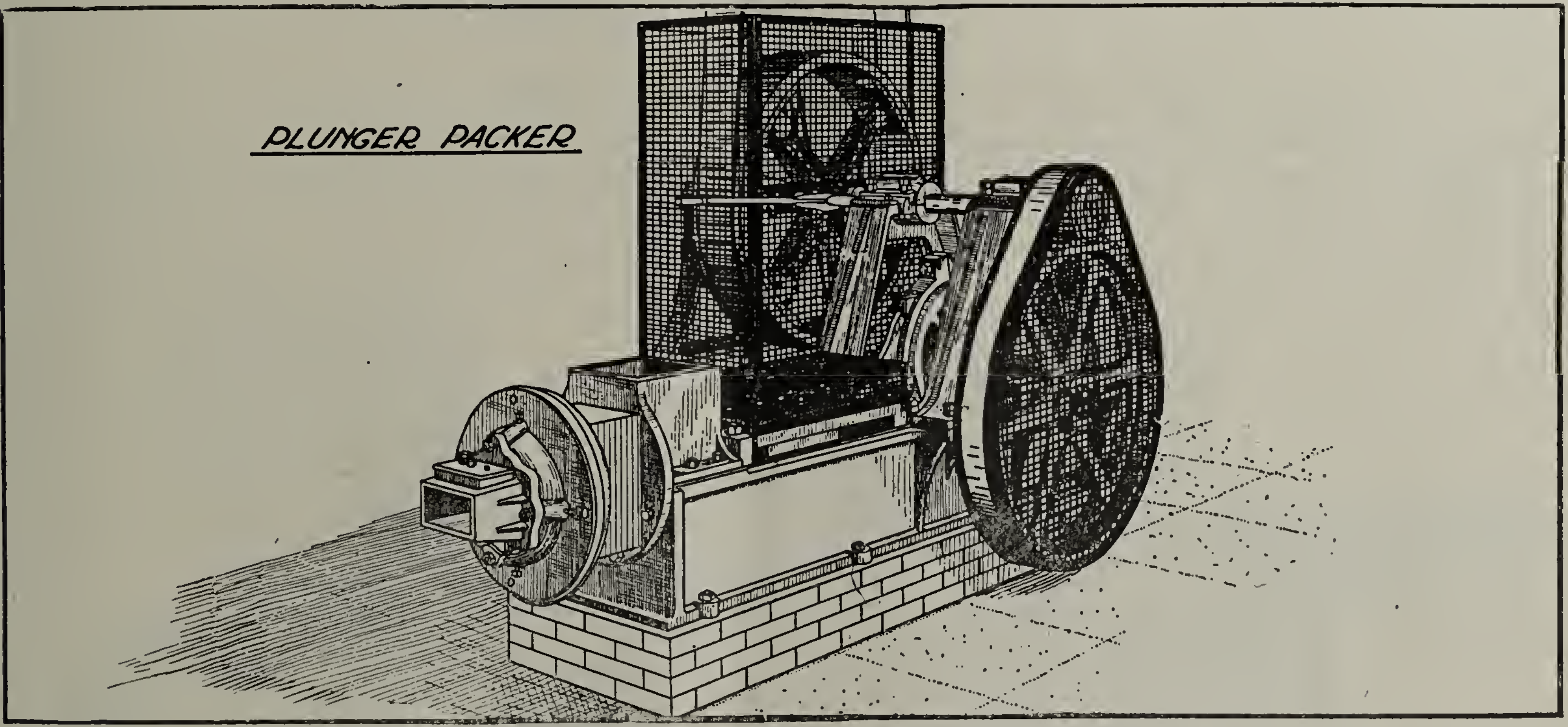


Figure 3. Plunger packer. The driving belt and pulley and clutch enclosed in standard guard, with a clutch lever extending to within easy reach of the operator. The shafting, gears, pinions, cross-heads and connecting rod completely enclosed.

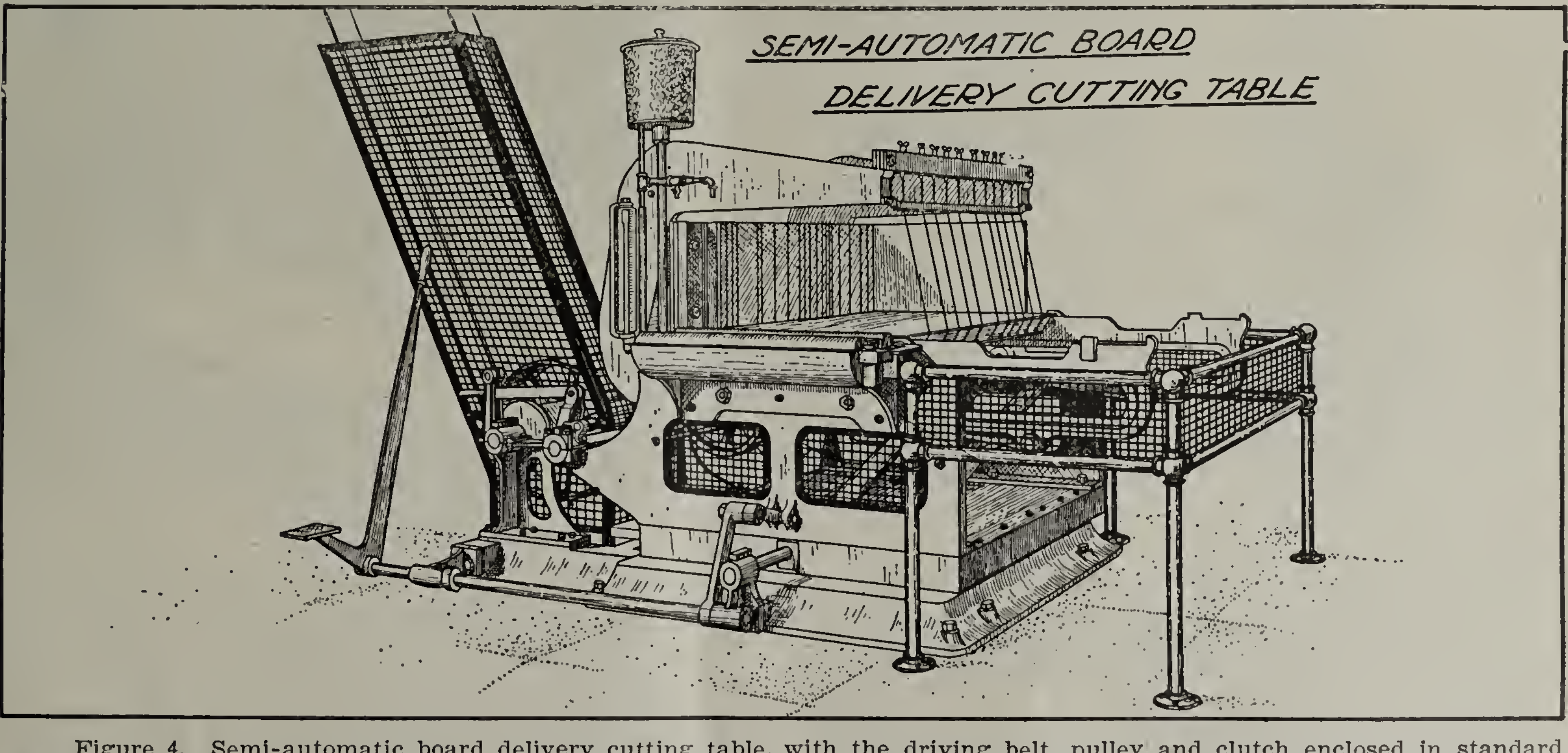


Figure 4. Semi-automatic board delivery cutting table, with the driving belt, pulley and clutch enclosed in standard guards; openings in the side frame exposing reciprocating and revolving parts covered with guarding material, and a removable railing surrounding all positions of the reciprocating delivery table.

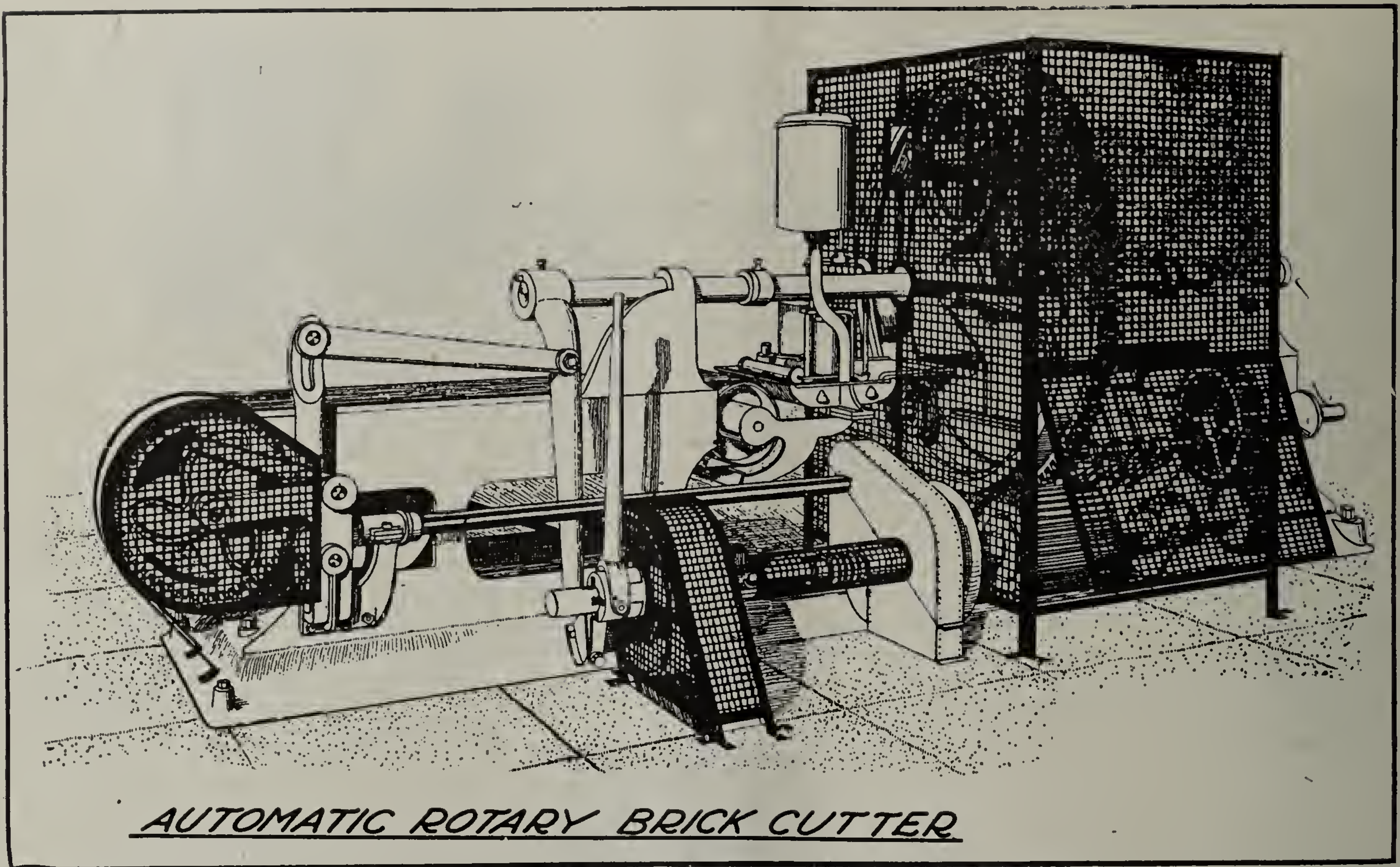


Figure 5. Automatic rotary brick cutter, with all belts, shafting, gears, clutches enclosed in standard guards, designed with necessary provisions for adjustment, maintenance and repair, with the clutch lever conveniently located. Rocker arms forming shearing points, protected from accidental contact.

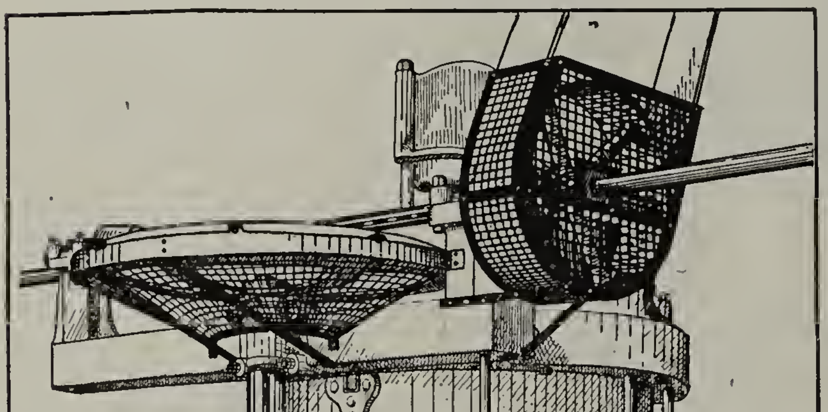


Figure 6. Plunger brick machine, with the driving belt, shafting, gears and pinions enclosed in standard guards, provisions made for greasing the different gears and pinions by stationary oil cups and removable doors in the guards.

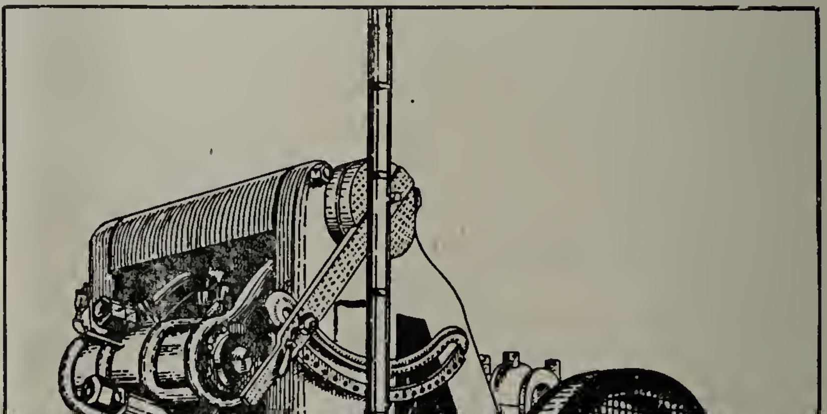


Figure 7. Press brick machine, with the openings in the frame exposing revolving and reciprocating parts covered, and with overhanging gears and pinions enclosed in standard guard. Starting and stopping lever is located conveniently near the point of operation.

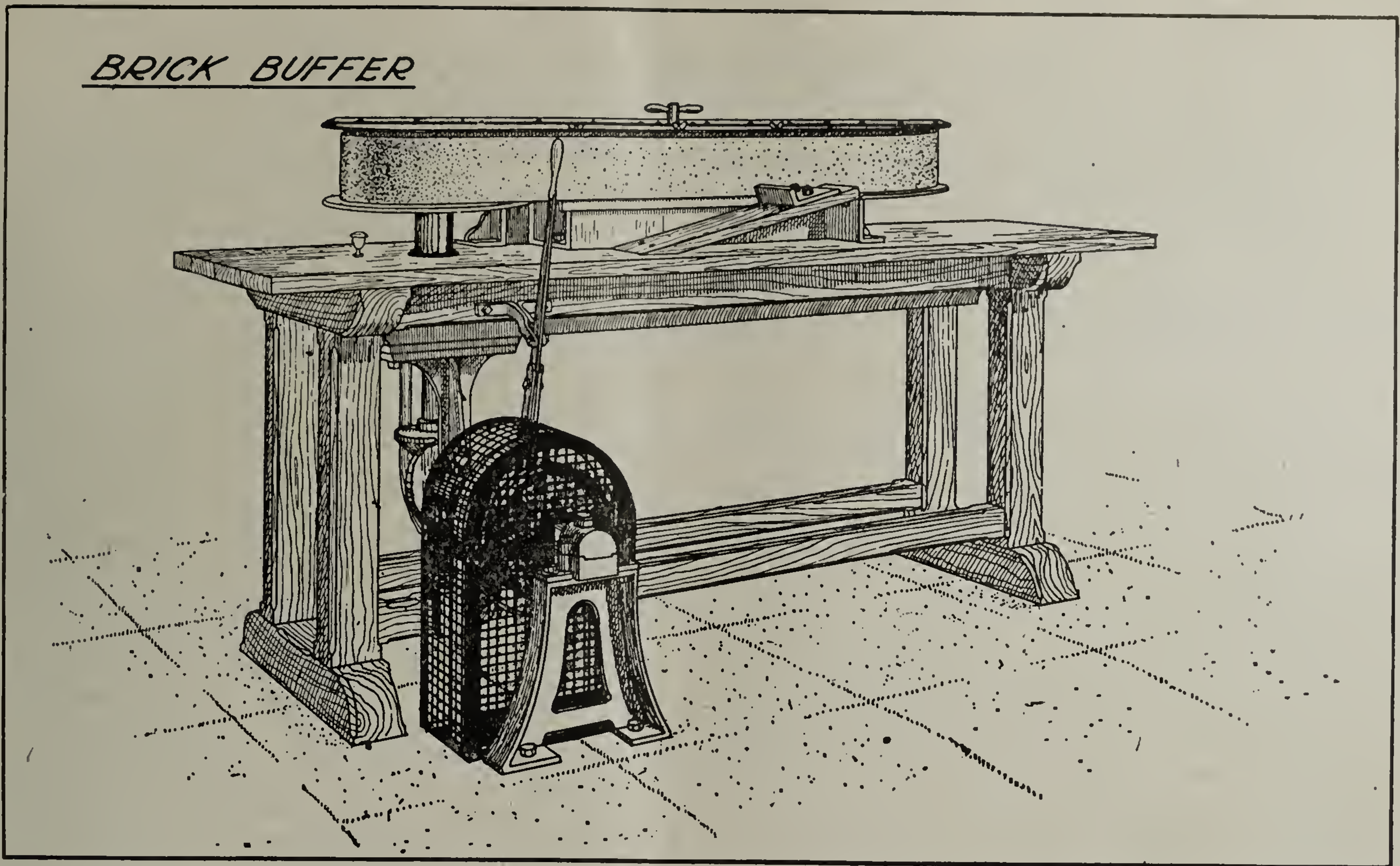


Figure 8. Brick buffer, showing the driving belt from a shaft below the floor, completely enclosed in a standard guard, with clutch, gears and shafting completely enclosed and the clutch lever extending through the guard and located conveniently for the operator. The upper side of the buffer pulleys are covered to prevent admission of hands or hand tools.

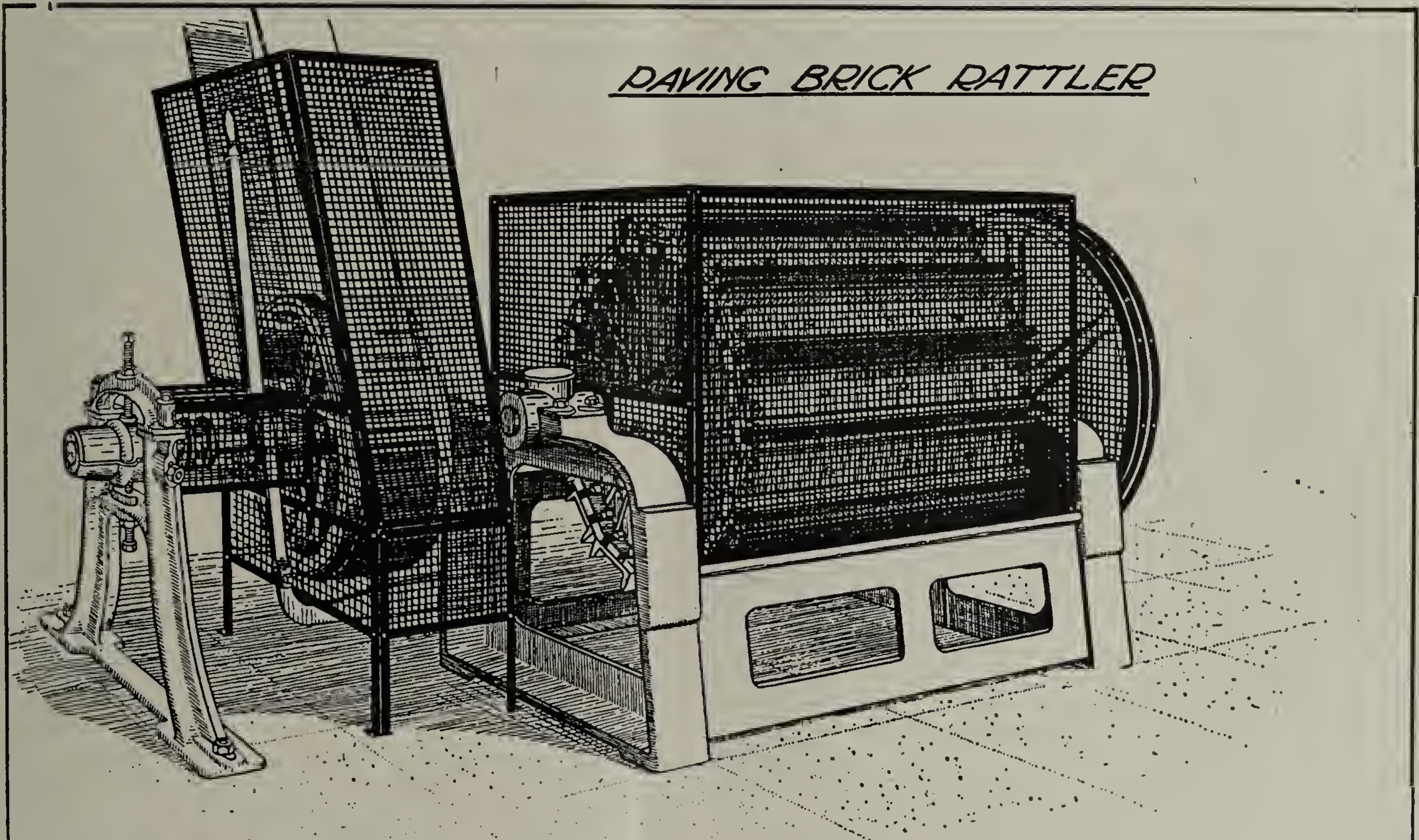


Figure 9. Paving brick rattler, with standard guards applied to all belts, pulleys, shafting, gears and clutches; with the clutch lever extending through the guard. The drum of this machine is completely enclosed in a stationary cage with the front side hinged so that a complete opening is secured for loading and unloading the drum.

zation of employes prevent accidents and produce efficiency."

The Safety Supplement to American Industries is designed to place before you principles and methods of guarding all accident hazards encountered in shops and factories in such a manner as to afford maximum safety and efficiency. Hints, criticisms and suggestions are solicited. In addition to this feature of our accident prevention service, the Committee on Health and Safety will consider all problems relating to accident prevention and render engineering services for the solution of specific problems when called upon.

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Committee on Health and Safety, R. W. Hicks, Engineer.
National Association of Manufacturers, 30 Church St., N. Y. C.

THE CERAMIST'S CORNER

This is a department which appears in The Clay-Worker from time to time dealing with practical and technical matters of especial interest to the ceramist. This month we give in full two papers which appeared in the transactions of the American Ceramic Society, Volume XVIII.

SOME USES OF CERAMIC MATERIALS IN THE ELECTRICAL INDUSTRY

By W. Angus Denmead.

IT WAS suggested to the writer some ago that ceramic engineers and producers of ceramic materials had, as a rule, no idea of the extent to which ceramic processes, products, and common materials are used in the electrical industry, and that a brief paper on this subject might be of considerable interest to producers of ceramic materials and wares. For your consideration, the following was prepared, in which I have attempted to give the major uses as headings, with brief ideas of the materials and processes wherever possible.

This paper includes all the uses with which the writer is familiar, but there are doubtless many other materials and products in use.

Under the first grouping is given the true ceramic products, in other words, the products that depend upon the formation of silicates for their properties to a considerable extent at least. In the second group is given the materials or processes in which the common ceramic materials, such as flint, clay, feldspar, whiting, etc., are used to a greater or less extent, but in which silicate formation plays either a minor part, or none at all. It may perhaps seem to be going out of the field to include the second group, but as this group should be of interest to producers of raw materials for ceramic purposes, it is included.

True Ceramic Products.

Electrical Porcelain. This product is probably the most important single ceramic product in the industry as practically all line insulation, as well as a multitude of wiring supplies, such as porcelain tubes, cleats, knobs, switch bases, socket covers, etc., are made of this material. It would appear as if this field will be developed far beyond its present status, as the strides taken in the past ten years have been very great. This product is almost invariably one-fire work, the glaze and body being matured together. The glaze is similar in formula to the body, but so designed as to melt several cones earlier, thus passing to a glaze by the time the body nears complete vitrification. The choice of mixture and ingredients as well as the preparation is highly important, as it is extremely desirable to reach as near absolute vitrification as possible without deformation. Electrical porcelain possesses certain advantages that will make it very difficult to replace, a few of which are cheapness, ease of forming to many shapes, permanence, heat and water resistance, high dielectric strength and appearance.

Compounds for Heating Devices. The growth of the heating device branch of the electrical industry has created a demand for a material that has a much higher dielectric strength and resistance than porcelain at elevated temperatures. A number of compounds are being produced for this purpose in which an attempt has been made to take advantage of the well-known properties of alumnia, magnesium oxide, lava and several other materials for the purpose, but in practically all cases the compound depends upon the formation of silicates during burning for the binder. There is a constantly increasing demand for these materials, and the ceramist is hard pressed to keep up with the electrical engineer's requirements.

Compounds Resistant to Breakage from Sudden Temperature Changes. As a great deal of electrical machinery has a tendency to heat up rapidly, and much of it is placed where it is exposed to the elements, there has arisen a demand for material capable of resisting sudden fluctuations of temperature better than porcelain. In this class are included heating device plugs and element supports, medium temperature electrical furnace linings, as well as spark plugs and the like, the nature of which makes such a material essential. Here again the formation of silicates is depended upon for binding, and materials such as alumnia, steatite, zirconia, etc., are added in an effort to impart their characteristics to the whole. This group somewhat overlaps that of the group above, and in general, materials fulfilling the requirements of one group will answer those of the other, but in a number of instances the requirements are quite different.

Molded Compounds. Lest this term be misunderstood, it may be well to state that by it the writer means practically any material (excepting porcelain and closely allied materials), which are formed in a plastic, or semi-plastic state, and afterward hardened and given the other required properties by heat, steam-pressure, treatment with chemicals, etc.

There is only one compound with which the writer is familiar that depends wholly upon silicate formation for its bond, but this is an extremely useful one, depending upon the sand-lime brick reaction for its success, in that this reaction causes the hardening of the compound and produces low porosity. Fillers such as asbestos may be used in the same to increase its strength, and the compound may be finally impregnated if porosity must be absolutely eliminated.

Refractory Materials. These are not directly related to the industry, but the development of the electric furnace for various purposes has created a demand for refractories of extremely high deformation point, good resistance to temperature changes and high electrical resistance at elevated temperatures. Among these materials are brick, linings for high temperature apparatus and other refractories, depending upon alundum, carborrundum, green oxide of chromium, magnesia, zirconia and many other materials for their refractory properties, but in most cases silicates are depended upon for the binder. There is a limited use in this industry for graphite blocks and tubes, through which large currents are passed, causing rise in temperature. These blocks are used in furnaces where extremely high temperatures are desired, and usually some neutral gas is used for an atmosphere in order to cut down the oxidation of the graphite units, thus prolonging their life. The binder for these blocks and tubes is usually a ceramic mixture. Arc lamp carbons, though not belonging strictly to this class are included here, and tho their production is a decreasing one, owing to the series incandescent lighting, it is still great. A ceramic mixture is usually loaded with a conducting substance, making the whole of very low resistance after firing.

Natural Silicates, as Insulators. Several natural silicates are used for various insulating purposes, a few of which are asbestos, mica and feldspar. Of these, of course, the most valuable by far is mica, and it is hard to imagine how the electrical industry would get along without this material. Mica for insulating purposes falls into two general groups, muscovite and phlogopite. The uses of the two micas are quite dissimilar, the former being used where highest dielectric strength and color are important and the latter where resistance to high temperature, greater resistance to abrasion as in commutators, etc., is necessary. Mica is used to a considerable extent merely split to the required thickness from the natural mineral as it occurs, but the greater part is used in what is known as "built-up" mica, this being a material made from comparatively small "splits" and a sticker of either organic or inorganic nature. Mica of the best quality is probably of the highest dielectric strength of all known materials.

Slate, soapstone and lava are used to a considerable extent for panels, bases, etc., and are very valuable, owing to their toughness and ease of working to shape.

Heat Insulating Materials. In this group are the minerals asbestos, kiesulguhr and diatomaceous earth, as well as several artificial products known under the trade terms of Poplox, Calorox, Fibrox, etc., the latter products depending on mechanical and ceramic processes which leave silicates in extremely fine state of subdivision at the end of the treatment. These latter materials are becoming increasingly important, owing to the necessity of perfect heat insulation in electric stoves and other devices to secure maximum economy and efficiency. The artificial materials far surpass the natural ones.

Glass. This material, used to a considerable extent at one time for line insulation, has now practically disappeared except for very low tension lines, but very recently new glasses have been invented which, if the maker's claims are borne out, will undoubtedly bring glass into wider use again. It is understood that the properties of these new glasses are supposed to be due to a considerable percentage of boracic acid or its compounds. The introduction of the new cooking glass ware, which seems to give satisfaction, would point toward the probability of such a glass being quite useful for certain insulations.

Glass is also used for a great variety of electrical parts, such as lamp and rectifier bulgs, lamp shades, reflectors, beads, etc.

Artificial Silicates for Resistances. Many attempts have been made to make use of ceramic products for resistances for extremely heavy duty. The writer understands that a ceramic mixture, to which is added various conducting substances and the whole fired to a dense mass, is used. One may readily understand that any success with such a product would necessitate the utmost care in every operation, as, of course, great uniformity of materials and handling would be absolutely essential in order that the manufacturer might predict the results of his mixtures. The economic production of such articles strikes the writer as the most exact ceramic problem of the day.

Enamels. These soft glasses are becoming more and more valuable to the industry, being used for finishes, for their diffusing properties in lighting devices, for insulated and weather-proof surfaces, as relays, resistance units and other small parts that are in exposed places and therefore should be water-proof.

Conduits. These ceramic products of the cruder sort are somewhat similar to flue linings and fire-proofing and are used to a great extent in large cities, where the use of underground cables, telephone wires, etc., require a permanent protective cover and spacer.

Other Uses of Ceramic Materials.

In this division the materials are used principally as fillers or to impart characteristic properties to the product, but in no case is the formation of silicates in the process of manufacture of great importance.

Cables. Several materials commonly used in ceramic wares are used in the manufacture of rubber insulated cables. Among these are calcium oxide and magnesia. These materials are used as fillers for retarding the action of destructive gases, etc., and play a highly important role in the efficiency of the cable. Asbestos is frequently used as a fireproof braid for wire.

Paints. Practically all ceramic materials are used in the manufacture of paints, for fillers, for their drying action on oils or other desired effects. By means of these materials the physical properties of the paints, such as the gloss, color, drying time, brushing and adhesive qualities, may be controlled. Among the common fillers are clay, barytes, oxide of zinc, dioxide of manganese and white lead.

Papers. The use of ceramic materials in this field is an indirect one, but also an important one, since insulating papers are used to a great extent, and the fillers commonly used in their manufacture, such as talc and clay, enter indirectly in the insulating value of the completed material.

Molded Compounds. Many ceramic materials are used as fillers for molded compounds, each material imparting to the molding, somewhat different physical properties. Considerable quantities of these fillers are used, the commonest of which are clay, flint, feldspar, whiting, marble, glass, mica, asbestos and talc. The fillers alter the strength, finish, ease of molding and machining, color, etc., and the properties of the molded compound may, in extreme cases, depend almost as much upon the filler as upon the binder. Hard rubber belongs to this group, as some of the above materials are used for fillers principally to reduce the cost.

PYROMETRY: PAST, PRESENT AND FUTURE.

By Edward C. Stover, Trenton, N. J.

Pyrometry is a many phased subject.[1]

The first pyrometric method was introduced by Sir Isaac Newton. It was a bar of iron which lengthened on heating, and this increase was taken as a measure of the temperature increase. The method was published in 1701.

The first practical instrument was designed by Josiah Wedgewood in 1782. This is a ceramic block which shrinks on heating, and its shrinkage is an indicator of the temperature attained. This instrument was without a rival for forty years, and is still employed in the pottery district of Staffordshire, England.

In 1822 John Daniel introduced the platinum bar encased in a plumbago cover, upon which was a scale to show the expansion of the platinum. This increase was read by means of a telescope. In the same year Seebecks discovered the principle of thermo-electrics. He found that a current of electricity is generated by heating a junction of two metals, platinum and palladium.

In 1830 Becquerel built an instrument of this type, but it was practically abandoned, and not until 1886 was it revived in a more practical form, and led to the present extensive use of pyrometers.

Dr. Herman A. Seger published his invention of Seger Pyrometric Cones in 1886 in Berlin, Germany, and their use in both Europe and the United States continues to the present time.

Even in the early days of pyrometry, each method was recognized as having special advantages in particular cases. Many potters, being ignorant of the particular adaptability of the different methods, have chosen a method not adapted to their needs, and hence have received more or less indifferent aid by its use. They have therefore condemned pyrometry in general.

The experienced potter is becoming more and more impressed with the importance of temperature changes on his ware in the kiln, from the beginning to the finish, and also in the rate of cooling. The time is fast approaching when combinations of the methods of pyrometry will be employed by the potter, so that he will know the condition of the various parts of his kiln, from start to finish, including cooling, in somewhat the same manner as the metallurgist has done. A great many metals are not only sold under specifications as to chemical compositions, but also as to the process of preparation and heat treatment necessary to insure definite results that can be accurately duplicated at any time.

The Present in Ceramics seems to be one of education. With the proper combination, including the recording pyrometer from start to finish, a great saving of fuel is possible, to say nothing of eliminating losses and producing a more uniform product.

The Solon shrinker rings are now being used by some people. This method necessitates withdrawing the ring from the kiln every three or four hours and taking actual measurement thereof. They have been found quite accurate, but they do not cover the time as closely as it really should be covered. This is admitted by many who are using them.

The Future. The time is fast approaching when the experienced fireman will refuse a position where recording pyrometers have not been installed to give him a chance to prove his claims of accuracy and economy in firing.

BRICK AND STEEL CHIMNEYS.

AS THE power producing world develops the habit of following carefully analyzed scientific lines in the construction of power plant equipment it realizes that burned clay is the real product in chimney construction and that the steel chimney is short of life and full of troubles.

The thin steel smoke-stack chimney commonly observed on the smaller power plants is really a form of temporary makeshift that sometime in the near future will perhaps be a great curiosity comparable with the practices of some pioneers of extending a thin metal stove pipe up through the home roof instead of building a chimney flue. This is because the thin metal neither performs its service as it should nor has a length of life to justify itself. It is hampered in performing its service by exposure to the air on the outside and the metal being thin this serves to condense and cool the gases on the inside so that the pull or draft for which the chimney was constructed is to quite an extent hampered and reduced.

Speaking of the troubles of the more pretentious steel chimneys, those built up of a succession of heavy steel plates riveted together, the National Engineer says they require protection both inside and outside if they are to have a reasonably long life and perform their work properly.

The simplest method offered for protecting the outside of such a chimney is to paint it and this paint must be renewed from time to time, so frequently in fact, that it is a matter of some wonder that we should have a steel chimney because in place of that outer steel shell might as well be a structural brick which will stand the test of time without requiring paint. Continuing further the National Engineer says:

"On the inside the chimney is exposed to the action of the gaseous products of combustion which may have a temperature of several hundred degrees. Any form of paint, therefore, would be useless. Besides, it must be remembered the gases which flow up the chimney are derived from the combustion of fuel containing carbon, hydrogen, and sulphur and, therefore, they contain carbon dioxide, steam and sulphur dioxide. The steam in the chimney gases will condense, if cooling takes place to any great extent, and the moisture will combine with the dioxides and sulphur to form carbonic acid and sulphurous acid. Both of these acids are corrosive in their action on iron, and they are particularly active in the presence of heat. Therefore the inside of the chimney needs to be protected.

"The usual method of protecting the interior of a steel chimney is to line it with brick, which is laid up against the wall of the chimney. It is advisable to fill the interstices between the lining with a grout made of cement, as this will not only give support to the brick work, but will at the same time prevent the corrosive acids from reaching the shell. Such a lining, to be effective, should extend to the top of the chimney. If it is carried only to half or two-thirds the full height of the chimney, the corrosion is localized at the part of the structure that is most difficult to reach.

"The formation of moisture, due to condensation of vapor in the flue gases, will occur in the upper part of the chimney, rather than in the lower part, because the gases grow cooler as they ascend, due to radiation from the shell of the chimney. Therefore, this is an additional reason for carrying the lining all the way to the top.

"It will be found, upon observing steel chimneys that are in service, that the signs of discoloration and corrosion on the outside are confined largely to the upper half of the structure. The rings or sections composing the chimney are put together in such a way that each overlaps on the outside the ring below it, so that the edges of the circumferential seems face downward outside. This construction prevents rain and snow from collecting on the edges on the plates on the outside. On the inside, however, the edges face upward, and if moisture is formed it will lodge on these edges, find its way through the joint, and run down outside, streaking and discoloring the chimney. A continuous lining from top to bottom will lessen the radiation loss, reduce and perhaps eliminate condensation, and in any case will prevent moisture from finding its way to the plates on the inside of the chimney."

A Suggestion for Overcoming the Annual Fire Waste.

So it is easy to understand from this that brick work is essential for proper construction even in steel chimneys. It must have an inner casing of brick and since the steel outer casing must all be protected with paint, frequently renewed, the logic is so plain that he who runs may read. The chimney of the future will be built of brick wherever permanency is a point in power plant construction.

ROCKEFELLER RELIEF WORK.

A recent annual statement of the Rockefeller Foundation appropriations for 1916 shows a distribution of practically 8¼ million dollars. The largest appropriations for last year were for war relief amounting to $2,590,000. The total amount appropriated for war relief from the beginning of the war to the first of the present year was $4,181,952.64.

The balance of the distribution was through various organizations, most of them affiliated with the Rockefeller Foundation, except 2 million, which is always subject to the requisition by Mr. John D. Rockefeller for uses designated by himself.

From the liberal support of war relief work already given it may be taken for granted that a fair share of the energies and funds of this organization will be put at the service of the United States in connection with its share in the war.

A LESSON LEARNED FROM FIRE

ONE OF the most important lessons the public is learning from fire is that a shingle roof is a dangerous thing, especially in the congested districts, because it makes practical the easy spreading of fires and the starting of them at points on houses difficult to get at.

This question was discussed at some length a while back by Thomas W. Haney, fire chief of Jacksonville, Fla. Mr. Haney has had wide experience both as a fire chief and as a student of the subject of fires and has served on the board of directors of the International Association of Fire Engineers and also as president of that organization.

He says among other things, that under the lessons to be learned from the fire we find the danger of shingle roofs and the manner in which they spread fires beyond the ability of a fire department to handle with an ordinary wind blowing even when a fair proportion of the buildings are of brick and have no combustible roofs and buildings are not congested, and the further fact that wide streets do not form a fire break when shingle construction is present.

50 TO 75% OF FIRE WASTE PREVENTED BY BUILDING WITH BRICK
BRICK MFR.
U.S.

A Slide that Should be Shown to Uncle Sam.

He gives some facts and figures of a startling nature from various fires with which he has been familiar and also points out that the shingles of today are of poorer quality and more flimsy than of older days and of higher prices compared to which fire resistive prepared roofings can be bought in competition with them and will bring lower insurance rates.

Such roofings, he says, speaking of the prepared roofings, are not comparable to tile, concrete, brick, tin or slate and unsuitable for roofing of buildings in congested value districts but are superior to wood shingles.

The point of particular interest here that it is desired to fasten upon for the benefit of our readers is that this authority, like all others when it comes to comparing roofing materials, puts the burned clay tile first, in a place where it is really not comparable with other roofing materials. Surely as we have said heretofore, with an unquestioned, widely recognized quality of superiority of this kind in its favor clay roofing tile ought to be a good product to boost and ought to be making more progress than it has been heretofore.

The Roofing Business.

We are being continually reminded of the roofing business, and the possibilities of the extension of burned clay in this direction, because as is well known clay tile is the best of all roofing material and so far it has made but little progress as compared to the possibilities in this field.

Some idea of the possibilities in this field may be had from a recent editorial estimate made by one of the lumber papers in which it is claimed that the annual expenditures for roofing material will run something like 200 million dollars in round figures.

A tabulation of the various roofing materials used today indicate from 12 to 15 million squares of shingles, 11 million squares of composition roofing, 5 million squares of slate and somewhere between 8 and 12 million squares of metal and clay tile combined.

The indications are that what is known as composition roofing has during the past few years been extensively replacing metal. There has been so much of this that metal roofers are complaining that their business is seriously curtailed and some of them have been turning to the making of cement tile and offering it in competition with the composition roofing and to fill in the loss of metal trade.

These things serve to show that there is an opening, a big opening, and that the time is ripe for a much more extensive pushing of clay tile, the best of all roofing material. The annual roofing requirements of the country call for between 35 and 40 million squares of roofing material. It is doubtful if at the present time clay tile is being used for 10 per cent. of this, whereas it ought to be used for somewhere between 50 and 90 per cent. of it. This shows that there is a big field in which to push burned clay roofing material. How much of the field may be captured for this material and how much business may be developed out of it depends considerably upon the activities in the development and exploitation of roofing tile manufacture and its use.

BRICK WALL MILL CONSTRUCTION.

One of the bulletins of the National Lumber Manufacturers Association illustrates the increase in mill construction by a report on the tendencies in industrial buildings made by W. P. Anderson, President of the Ferro-Concrete Construction Company of Cincinnati, to the National Convention of the American Concrete Institute at Chicago.

This source of information is interesting because it illustrates an acceptance of figures compiled by concrete men on the part of lumbermen. The figures in the case tell of the comparative quantity of different types of construction as follows:

	Erected during 18 months previous to August, 1916 Square Feet	Increase first 6 months in 1916 over 12 months in 1915 Per Cent
Concrete construction	6,739,014	83
Mill construction	2,278,734	200
All wood	548,748	(a) 30
Brick mill construction	1,218,980	80
Brick walls, joist floors	884,972	140
Brick walls, steel frame	884,972	(a) 20
Brick walls, concrete floor	167,052	(a) 40
Brick walls and steel frame	725,006	(a) 70
Concrete steel frame	1,016,659	40

(a) Decrease.

There are several interesting things about this table and it should be studied and analytically by those interested in brick. The biggest increase shown is in mill construction, which is certainly encouraging as this mill construction is mainly of brick walls. This is not the only interesting feature, however, when we look at the total of concrete construction as compared to mill construction, there is evident some room for still greater growth in the brick wall business. Study the figures carefully and see if you can understand their significance and how such figures of the future may be altered materially by a proper effort in exploiting brick.

FIRE AND CLAY

FIRE is recognized as the most widespread and generally useful agent of the human race. It is a source of comfort, of power; it is the agent for converting our metals and rendering them useful to mankind, and burning by fire constitutes an important performance in the work of making our great line of clay products.

There is perhaps no use to which fire is put as an agent of mankind where the results are more striking or beneficial than in connection with clayworking. For the very history of civilization itself has been handed down to us on slabs of burned clay—the result of a combination of clay and fire.

No one knows just when and where or how fire was first discovered or put to specific uses of mankind. We can trace back certain designated uses of fire, such as for making steam, but the original discovery of how to use fire as an agent for mankind is lost in obscurity.

We know that there was a time in the world down in Egypt when brick were made of clay and straw and baked in the sun. Also we know that later they were further baked by fire, and out of this developed the modern brick industry.

The suggestion one gets from a study of the available scraps of ancient history is that fire and clay were both used together or rather fire was used to harden clay in connection with pottery before it was in brick making proper. The historical records of the pottery industry tell us that one of the most remarkable uses to which earthern ware was put in ancient times was that of inscribed tablets. In Mesopotamia immense numbers of square tiles have been found with characters inscribed on them which have furnished history to modern scholars. They were practically books, whole libraries of them, made of slabs of clay and baked or burned by fire to render them everlasting. The records of some of these have been fixed as far back as 2,000 years B. C., positively, and there is a suggestion of burned clay tablets much further back than then. One of the legends of ancient times is that people had learned to burn clay even before the flood for it told of a vision coming to one of those early rulers warning him of the flood and advising him to inscribe the history of his people upon burned clay slabs so they would be preserved through the flood for future generations. We have the authority of that great historian, Charles Rollin, that Nimrod, the great-grandson of Noah, either built or rebuilt Babylon and Nineveh and it is evident not only that he used brick but that they already knew how to burn clay to make substantial brick, clay slabs and pottery. Indeed as far back as we have been able to go into history we have found burned clay in the form of pottery. We find it not only among the Egyptain ruins but among Indian and mound builder's relics in our own country, and as a part of the ancient history of all countries. Really the burning of clay evidently in itself was that which established the records of ancient history and there is no history much which goes beyond the days of burning clay. Moreover, had the people not discovered this useful combination of fire and clay we would today be much more in the dark than we are as to history of the people in the earlier days.

So in the matter of history alone fire and clay have performed a service for mankind that is wonderful to contemplate and it is a service for mankind that is wonderful to contemplate and it is a service beside which practically all other accomplishments pale into insignificance.

As to how it started, how people learned to burn clay, or found out that by burning clay it would be hardened and made the most durable substance on earth, is a matter of speculation pure and simple. One plausible idea is that it resulted naturally from building fires to secure warmth and some of these fires having been built in clay holes or against clay banks so hardened the clay adjacent to the fire that it attracted attention and led to experiments with burning specific pieces of clay, and out of this was developed the great clay working industry, the first and in many respects the greatest industry of mankind.

The general application of the use of fire for burning brick for building purposes evidently came gradually as the needs for it arose. At first the quickest and easiest way was to make slabs of clay and bake them in the sun or build stiff clay walls and let the sun bake the wall. By and by as more pretentious and more permanent structures were needed people turned to the use of fire, which they had already learned in connection with burning pottery, and thus was gradually developed the practice of burning the brick to make it more solid and lasting and a better building material. In time as civilization spread around the world and various climatic conditions were to be met with the process of burning was improved somewhat, and eventually as ideas of art developed and architectural beauty became an object of mankind there came naturally a seeking for different shapes and colors, and from this motive we have developed our extensive face brick industry and architectural terra cotta of today.

One could follow at some length the transformation of the clay working industry from a crude hand craft into the modern scientifically analyzed and mechanically handled business of today and find much of interest therein to set forth. However, it would take quite a lengthy treatise to cover this phase of the matter, and besides the present purpose is rather to impress something of the wonders of fire as an agent and clay as a material for the use of mankind. Fire is in many respects the greatest and most useful agents of mankind when under control, and one of the most destructive when it is uncontrolled. Clay is one of the most widespread of our mineral products and is found in such a variety of combinations as to chemical constituents that it can be used for a very wide range of purposes all of which fit in peculiarly with the needs of mankind. With the combination of clay as a material and fire as an agent we have not only the oldest industry of mankind but one that is of first importance, because it preserves our history, it houses and protects humanity, it serves more good purposes than any other one material, and last, it has, if properly burned, the quality of greater durability than anything else which has been produced by mankind.

H. H. TITSWORTH ON FEDERAL COMMITTEE.

The president of the Clay Products Company of Brazil, Ind., has been appointed a member of the committee that will buy war munitions for the government. He was called to Washington by wire. His work will be in connection with that of the council for national defense. Mr. Titsworth is well known in the clay trades, having been president of the Hollow Tile Manufacturers Association until recently.

HOLLOW TILE TEST.

Investigation to Develop Strength by U. S. Bureau of Standards.

A series of investigations of the strength of hollow tiles as developed in walls of varying thickness has been started at the United States Bureau of Standards by the construction of a number of these walls 5 feet long by 12 feet high. The walls so far constructed are of three thicknesses—6, 8 and 12 inches. Those already laid up have been set with the tile on end. It is proposed to construct walls of similar size with the tiles placed on their sides. Other variables will enter into the work, and when the investigation is completed about 50 will have been built. Some of these will be tested by direct compression; others by applying a load across the middle of the side with the purpose of determining somewhat the ability of these walls to withstand wind pressure.

The investigation has been undertaken at the request of several manufacturers of this material. Some of the data will be made available for the American Society for Testing Materials, which is now engaged through one of its committees in adopting specifications for hollow building tile.

A CLAY WORKER IN THE TRUCK GAME.

R. WM. E. DEE, who is President of the following well-known clay companies, the Wm. E. Dee Co., of Chicago, Ill.; the Wm. E. Dee Clay Mfg. Co., of Mecca, Ind.; the Wm. E. Dee Clay Works Co., of Newport and Cayuga, Ind., and the Wm. E. Dee Clay Products Co., of Oak Hill, O., is also President of the Harvey Motor Truck Co., of Harvey, Ill. Mr. Dee got into this game through his seeking trucks for service in his business, knowing full well that to be up-to-date in deliveries, motor trucks had to be used in order to make prompt deliveries at his different plants.

He and a company purchased the Chicago Commercial Vehicle Co.'s plant at Harvey, Ill. These people were manufacturing trucks, the first in the West, and were used in service on Rush Street, Chicago, as busses, in years gone by. This plant was purchased by the Harvey Motor Truck Co. in 1911 and they have been manufacturing trucks ever since. They make 2½-ton, and 3½-ton and 5-ton trucks for heavy work, as well as tractors. Their trucks are now being used all around the City of Chicago by different material dealers, to whom they can refer as to the service the Harvey gives. They have Service Stations in the city at different points for giving proper care to their customers. Their trucks have been shipped all over the country and are now being used as far south as Havana, Cuba.

A Harvey Truck Delivering Brick, a Service for Which it is Admirably Adapted.

They are well up in the requirements of the building material dealers and especially in the brick line, having just completed a tractor and trailer outfit for the Standard Material Co., of Chicago, Ill.; the owners of which cannot say too much for this outfit. The first purchase of a Harvey was made by the Standard Material Co. in April, 1916. This truck has given such good service, running 17,000 miles up to April 1st, 1917, and they were so well satisfied with it that they gave another order for a similar truck as well as an order for a tractor and two trailers.

Mr. Dee insists that everything connected with this truck be the best, the same as he does in all the other lines in which he is connected, and the truck has certainly given the service as there are none for sale second hand and they are used by the very best dealers and merchants in Chicago and other places. See Ad on page 644.

SALMEN BRICK & LUMBER CO. TO HELP U. S. WITH SEAGOING TUGS AND LAUNCHES.

A fleet of seagoing tugs and launches and a derrick and dredge, valued at $250,000, has been offered by the Salmen Brick and Lumber Company, through Fred W. Salmen, one of the officials of the firm, to the Gulf Coast Naval Training Association for coast defense purposes, it was learned Tuesday.

The fleet when called into service will be used for harbor patrol, mine field patrol, coast patrol, mine-laying and sweeping, operations against enemy submarines and aircraft, dispatch boats, co-operation with land forces and transportation of supplies.

THE HARBISON-WALKER CO. TAKES $1,000,000 WAR BOND.

The Harbison-Walker Refractories Company, of Pittsburg, Pa., have subscribed for one million of the war bonds to be issued July 1, 1917, $500,000 of these bonds being for the company and the other $500,000 to be subscribed for by the employes of the company individually. Approximately $200,000 of these bonds have been subscribed for by employes, and there is little doubt that the whole $500,000 will be covered at an early date if the patriotic spirit already exhibited by employes is any criterion.

When the machinery equipment of a plant is in bad order it consumes too much power and doesn't give the results it should.

Written for The Clay-Worker.

PLANT MANAGEMENT

By Richard B. Hoehne.

Part III—The Mechanical Forces.

FROM A PURELY scientific point of view, this chapter should cover all forces caused by matter or motion. Owing to the nature and purpose of this article, however, the subject has been divided as previously stated, and none but motive forces will receive attention at this place. The motive forces in a clay-working plant are identified by its mechanical equipment, thus spoken of as mechanical forces.

Later divisions of this writing will demonstrate that the mechanical equipment does not occupy the foremost rank of importance, yet the share accredited the machinery is sufficient to impair the success of an entire establishment. The character of the mechanical outfit itself implicates the situation, as hardly an individual machine can accomplish its purpose unless all devices linked for one particular end are operative. Since the installation of reserve machinery is practical only to a very limited degree, there exist no other means to insure continual operation, save to avoid defects. However importune this suggestion may impress at the first glance, the histories of a number of plants furnish evidence that they did accomplish it; how could they otherwise have succeeded in keeping their plants going year in and year out? Those are but few, however, and the average does not follow their example, because the principles governing the successful operation of machinery are either unknown or not effectively adhered to.

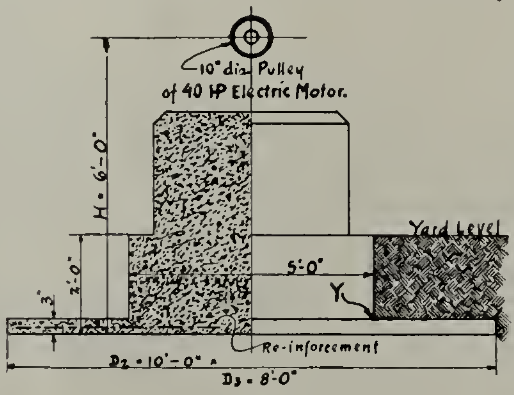


Figure 1.

From the experience gained through my work as an efficiency expert I have formed the opinion that the causes of inefficiency are about equally divided between "lack of attention in the operation" and "deficient or impractical erection." While in ordinary cases the former is easy to adjust, considerable difficulties generally arise in the attempt to correct faults made in the erection. This signifies that an improvement of conditions should set in at the ground floor. Due consideration given the machinery during the course of erection will eliminate at least 50 per cent. of the customary troubles.

With increased capacity and higher technical perfection, the nature of machines has become more delicate, which suggests to discard old-time ideas relative to their treatment. Instead of drafting the machinery layout by means of a cane in the dust accumulated at some unfrequented section of the yard, it is necessary to have this done by pen and ink with a liberal amount of experience and training behind. The timely tendency of adopting mechanical devices for doing the work of men contributes materially towards complicating the equipment of a modern plant. Therefore, it becomes necessary to do the erection on hand of plans carefully prepared and figured to meet the local requirements.

Owing to the multitude of machines and apparatus admitted into the clay industry, a hazardous task would lay before me, shold I refer to every one of them. I will, however, take the liberty of discussing common instances, where the adherence to technical principles would save a whole lot of disappointment and loss in both time and money.

One of the important features is encountered in laying the foundations. Disposing of this work on hand of foundation plans furnished by the manufacturer is all right, provided the conditions of the soil excavated are normal. The plans received with the machine usually are of standard make and very general in character. In other words, they are not made for the installation of one particular machine at a specific location, but they are to go with all machines of that size and type. For this reason the man in charge of the construction is expected to possess and employ sufficient judgment, as to whether the foundations specified are proper for a particular location.

I hardly need to say that the size of a foundation is not only determined by the size and nature of the machine, but it is largely governed by the conditions of the ground upon which it is being placed. This may become more feasible by explaining what a difference there is in the load-carrying capacities of various kinds of ground. While solid rock will carry from ten to twenty tons per square foot, and shale solidly lodged from six to nine tons, the permissible load decreases considerably when a foundation is to be rested on soft sandstone, or on soil consisting of a sandy loam, where the allowable stress may dwindle to 1,500 or 1,600 pounds per square foot. Yet, even the latter class of earth would safely carry a machinery foundation as occurring in the brick industry. In many instances, however, brickyards, or allied manufacturing establishments, are started in swampy regions, where a square foot of soil often is not capable of safely carrying 50 or 100 pounds. The same may be said of quicksand, which in many localities represents a serious obstacle to foundations.

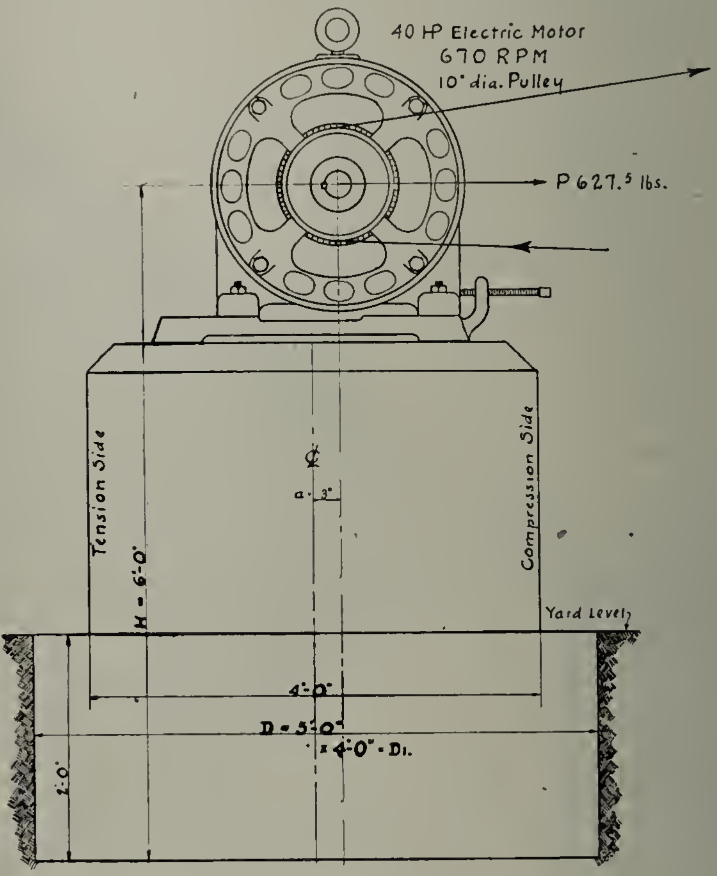


Figure 2.

The load carried by the foundations is not solely represented by the weight of the machine mounted on it. This merely is part of the dead load, to which has to be added the weight of the foundations and the life load, or working stress of the machine. As the latter seldom acts in a vertical direction, its force has to be determined relative to a neutral axis running vertically, to ascertain the load transmitted by the foundation.

To give an illustration of the procedure necessary to calculate the strength and safety of machinery foundations, the appended sketch, Fig. 1, is intended to indicate a 40-h.p. electric motor running at a speed of 690 r.p.m. The concrete base mounted upon foundations of the same material is projecting about 2 feet 6 inches above the ground. In the first place has to be determined the torgue of the motor:

$$T=\frac{60\times6600\times40}{2\times3,14\times670}=3765 \text{ inch-pounds.}$$

Herefrom may be figured the stress P prevailing in the circumference of the motor pulley, and also in the belt:

$$P=\frac{3765}{5}=753 \text{ pounds.}$$

In the further progress of this calculation the following abbreviations stand for:

M=bending moment at the bottom of the foundations.
W=total dead load.
e=eccentricity.
k=kernel of bottom section.
A=area of bottom section.
O°=dead load carried per square foot of the soil.
O''=compression side) extreme loads carried at the out-
) skirts of the foundation per
O'=tension side) square foot of soil.

$$M=P\times H=753\times6=4518 \text{ foot-pounds.}$$

$$W=(5\times4\times2+4\times3\times2.5)\times135=9450$$

plus weight of motor 550

10000 pounds.

$$e=\frac{M}{W}=\frac{4518}{10000}=.45 \text{ foot.}$$

$$k=(D-2a)\times.118=.53 \text{ foot.}$$

$$A=D\times D1=5\times4=20.00 \text{ square feet.}$$

$$O^\circ=\frac{W}{A}=\frac{10000}{20}=500 \text{ pounds.}$$

$$O''=O^\circ\times(1+\frac{e}{k})=500\times(1+\frac{.45}{.53})=925 \text{ pounds.}$$

$$O'=O^\circ\times(1-\frac{e}{k})=500\times(1-\frac{.45}{.53})=75 \text{ pounds.}$$

What Does This Calculation Show?

The concluding figures, 925 pounds or 75 pounds, respectively indicate the extreme load which a square foot of soil below the foundation will be exposed to when the motor is pulling 40 h.p. Inasmuch as the motor is equipped with an adjustable base, this had to be taken into consideration. For an extreme position of the motor towards the compression side, the compression of 925 pounds would be the guiding figure, while for the extreme opposite location the minimum compression of 75 pounds should guide. The latter figure presents evidence that at full load a certain compression prevails throughout the bottom section, which is an absolute requirement. To understand this fully, it is necessary to imagine that the horizontal pull of the motor will tempt the foundation to tip over the edge marked "compression side," thereby exerting a lifting action at the opposite corner, thus called "tension side." The derived figures indicate the exact degree to which said attempt would be successful, namely, that no lifting at the tension side will take place at all ,as there is a compression of 75 pounds per square foot, even with the motor in the most unfavorable position. Hence, the maximum load of 925 pounds per square foot at the extremity of the compression side gradually diminishes towards the tension side until it reaches a minimum of 75 pounds per square foot. Thereby is proven that the working stress of the motor is not capable of lifting any section of the foundation off the soil, and this in turn can be taken as relative evidence that the foundation is safe against vibration.

The preceding explanation could be objected to on the ground that the foundation is larger than required, as naturally the very principle would be attained with $O'=O$ pounds. In view of a possible overload of the motor, and excess in its torgue when being started, the measurements adopted for the foundation may be taken as correct. To insure a smooth and sound operation of the machine, it would only be necessary to have it securely and tightly anchored to the foundation.

Furthermore, the previous reckoning sets forth that the ground below the foundation will be required to resist a vertical load of 925 pounds per square foot. Any normal soil will do this. But now, supposing there is quicksand or swamp at the place excavated, or it were underlaid with wet clay or loam. In a case of this kind the degree of resistance obtainable from the soil should be determined by test load, and if any satisfactory results are shown, the adoption of an arrangement for distributing the load over a larger area might solve the problem. Fig. 2 shows this method in detail.

A 3-inch concrete slab covering an area of 80 square feet is stretched out below the foundation, reducing the extreme load to be carried per square foot of soil to 293 pounds, as will be proven by the following calculation:

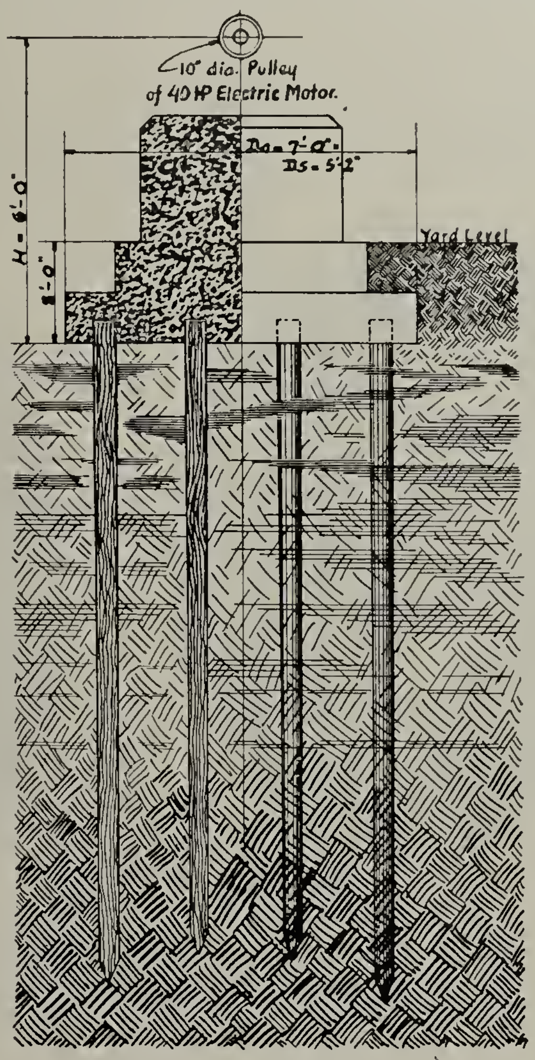


Figure 3

$$M2=M=4518 \text{ foot-pounds.}$$

$$W2=W+\frac{(10\times8-5\times4)}{4}\times135=12025$$

plus weight of filled-in ground= 7500

total=19535 pounds.

$$e2=\frac{4518}{19525}=.23 \text{ foot.}$$

$$k2=(D2-2a)\times.118=1.12 \text{ foot.}$$

$$A2=D2\times D3=10\times8=80 \text{ square feet.}$$

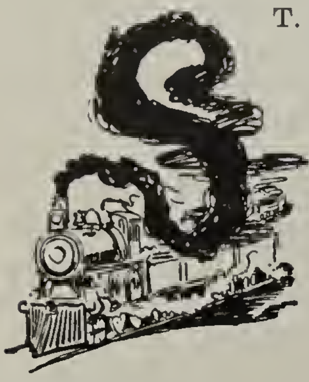
$$O^\circ2=\frac{19525}{80}=244 \text{ pounds.}$$

$$O''2=244\times(1+\frac{.23}{1.12})=293 \text{ pounds.}$$

((Continued on Page 642.)

THE PAVING BRICK INSTITUTE

Semi-Annual Meeting at St. Louis Marks Progress for the Organization.



ST. LOUIS is very popular as a convention city; especially so to clayworkers, owing to the numerous and extensive clay plants located in and about the city, each and all of which are open to inspection the year around. Visitors, particularly clayworkers, are always welcomed most cordially by the local craftsmen, who, though ever so busy, always find time to extend the glad hand and open wide their gates to their fellows in the trade. Hence, the announcement in the April issue of The Clay-Worker that the semi-annual meeting of the Institute would be held at St. Louis, May, was good news to the active members of the Association.

President Fred Kanengeiser, Youngstown, Ohio.

Chairman Eben Rodgers, Alton, Ill.

Secretary H. H. Macdonald, Cleveland, Ohio.

The business meetings were held in the library of the Jefferson Hotel, where the members "talked shop" all of Tuesday afternoon. The forenoon was devoted to a meeting of the board of directors. The chief achievement of the meeting was the adoption of the system of cost accounting, on which a committee has been laboring industriously for some months past, under the advice of Ernst & Ernst, certified public accountants. It is quite comprehensive, but devoid of technical intricacies. The chief purpose is to provide a system for uniform cost finding methods, by which may be obtained costs of production on a basis which will permit intelligent comparison. The expenses incident to the various operations and the various materials entering directly or indirectly into the manufacture of paving brick, for cost finding purposes, are divided into thirteen groups, as follows:

1. Shale or clay mining expense.
2. Transportation and processing expense.
3. Power generation expense.
4. Machinery expense.
5. Drying expense.
6. Transferring and setting expense.
7. Burning expense.
8. Sorting and drawing expense.
9. General plant expense.
10. Fixed charges.
11. Office and administrative expense.
12. Rehandling expense.
13. Selling expense.

In the report each of the groups is considered in detail, and at the close of the report a summary statement is presented, designed to show a complete and systematic procedure by which may be determined, through the various progressive steps outlined at the close of each accounting period, the cost of the finished product delivered into stock, the cost value of the product in process of manufacture, and the units of production, both finished and in process.

The report as a whole is complete in every detail, and a copy is supplied to each of the contributing members. Others desiring same can obtain the report from the secretary, H. H. Macdonald, Engineers Building, Cleveland, Ohio. It is hoped that the system will be adopted by practically all manufacturers of paving brick.

After the adoption of the cost accounting system, the delegates devoted themselves to various matters pertaining to the operation of the plants. The following formal paper was presented:

USE OF EXPLOSIVES IN SHALE QUARRYING.

By Mr. C. B. Willis, E. I. du Pont de Nemour & Company.

Aside from the actual mining or removing of clay and shale there are several uses to which explosives can be advantageously applied in connection with the digging of clays.

Some of these uses are for stripping overburden, removing boulders and ditching wet pits. In open pits probably the greatest difficulty the operator faces is the matter of stripping. Where the stripping has considerable thickness and a steam shovel is employed for this work, explosives can be used in removing stumps or splitting them by light charges so that the machine can lift them easily; in the stripping and loosening frozen or hardpan strata so that the machine can operate with the least exertion.

By the use of the low grade explosives it has been proved that hardpan soils can be shattered very economically. The method of placing the charges for this work depends to a large extent upon local conditions. If the soil to be shattered is thick, charges must be loaded well toward the bottom of same and loaded sufficiently heavy to shatter the entire hardpan strata.

If the hardpan is of a thin layer, say from 18 inches to two feet in thickness small charges placed in the center of the strata and spaced from six to eight feet apart will shatter it sufficiently for the machine to remove it without difficulty.

Where a small amount of stripping is encountered and the clay strata is thin it has been found that such clay can be removed to advantage by working the clay up to the face of the overburden and by using dynamite throw the overburden into the worked out pit. For this work small charges of dynamite should be used in holes spaced close together and near the face. In such shooting the best advantages are obtained by using a blasting machine and firing a number of charges at once.

In using explosives for ditching wet pits two methods may be employed, one by the use of a high-grade dynamite, depending on one blasting cap to fire a large number of holes. This manner is feasible only where the ground through which the ditch is to be constructed is wet and warm. The practice is to prepare a number of holes with an iron bar, the depth to depend on the depth of the ditch required.

As an example we would say that a ditch three feet deep and from six to eight feet top width is required, holes would be made not over two feet deep spaced 18 inches apart in the running line of the ditch, each hole to be loaded with one cartridge of 50 per cent. straight nitroglycerin dynamite. When the holes have been loaded the required distance, prime an extra cartridge of dynamite and load it in any hole which has already been charged, this hole to be located near the center preferably. When this cartridge is exploded the entire line will be exploded by the propagation of the explosive wave from one hole to another. In attempting to blast in this manner it should be very carefully noted that the proper grade of explosive must be employed and the ground wet and warm. The reasons are, that only a high grade of nitroglycerin dynamite, which is the most sensitive dynamite manufactured, will detonate when applying this principal, also that this grade of dynamite freezes very easily, the actual freezing point being 45 degrees Fahrenheit and when frozen is hard to explode.

It has also been proven that this method will not work in dry ground as the water in the soil works as a blanket to hold the explosive wave to a level with the next hole. Dry ground acts as a cushion against the next cartridge.

The second method is by the use of a lower grade low freezing dynamite and a blasting machine. The holes are spaced in much the same manner, but are made a little deeper and an electric blasting cap must be loaded in each hole, the number of holes to be fired depending upon the capacity of the blasting machine employed. This method of firing is somewhat costlier than the propagation method previously described.

In the actual digging of the shale or clay, explosives play a very important part. The method of blasting and the explosive used depends entirely upon the nature of shale and the height of the face. Usually for shallow faces and flat stratification the best practice is to punch verical holes from the top of the bench. These should be placed back from the face a distance slightly greater than the depth of cut for work up to seven feet and a part and equal distance. For deeper work the spacing can be increased.

As a rough estimate the spacing back and apart of holes from 14 to 20 feet high is one-half foot for each foot of height. It is a good practice to drill the holes well below the pit floor. This will prevent a shot blowing out at the bottom and will insure a more heavng action resulting in the material being more thoroughly mixed. A 20 to 40 per cent. low freezing dynamite is best for this work.

Some shales, especially those having a dip, are best shot down by the use of horizontal holes, sometimes as snake holes, made into the face near the level of the floor. Where the nature of the shale will permit, these snake holes should be sprung by exploding several cartridges of dynamite in the back of the hole without tamping. This will permit the placing of the charge in a very compact manner and where the hardest work is to be done.

On faces of 25 feet or higher the use of larger bore holes is desirable to promote better distribution of the charge and reduce the cost of drilling and loading and overcoming the necesity of springing. For preparing such holes, a blast hole drill, commonly called a well drill, is used. Such a drill should be fitted with a 4 or 4½-inch bit. The spacing of these holes depends upon, to a large extent, the depth of the strata. For a 25-foot strata the holes spaced back 10 and 20 feet apart will generally give the best results. For deeper faces the holes can be spaced back farther and farther apart. The maximum spacing for any depth or face is usually 25 feet and more often 20 feet.

There are two manners of loading these holes. One is to load the hole with explosives solid up to a certain depth. The other is to break the charge where a continuous charge of dynamite is too heavy. The method of breaking the charge is to load a certain quantity in the bottom of the hole, priming same with an electric blasting cap, load in tamping until the hole is raised to a depth where the second charge is to be inserted, load in the required amount of explosive, prime with an electric blasting cap, the hole then tamped to the collar.

One customer's problem coming under my attention was a 30-foot face of comparatively loose shale which the operator was endeavoring to remove with a steam shovel. This shale was underlaid with a 2-foot strata of wet clay, which had resisted all methods to blast by vertical loading and interfered with the operation of the shovel to the extent that when the wet clay was removed it would permit the dryer shale to slide and cover up the machine.

This customer's problem was very effectively solved by punching holes at a 45-degree angle into the wet clay; these holes space 2 feet apart and loaded with two cartridges of 40 per cent. low freezing dynamite, firing by electricity. It was found that this would throw out the wet strata and sufficiently shake the material above to allow it to slide, and the removing by the machine was an easy problem.

Digging Plastic Clays.

The method used in this work is very much similar to the method employed in removing stripping. Very often it develops that plastic clays differ, the top strata being of a different nature from the bottom strata, and where this condition exists the use of explosives is beneficial in mixing the two stratas.

It sometimes develops that loose boulders are encountered and blasting will not only loosen the hard clay, but materially assist in getting out the boulders and sending the clay to the plant in better shape. The best results can be secured in this class of work by blasting when the ground is dry.

Some plastic clays are troubled with hard pebbles which must be removed, and where that condition exists the use of explosives is not recommended, as it makes the removing of the pebbles a more difficult proposition.

Mining Flint Clays.

This work is practiced in much the same way as coal mining, using horizontal holes spaced according to the height and face of the rooms. The method consists usually of a breaking in shot near the center and bored at an angle, then the rib and slab shots to straighten up the face. The usual method is for these shots to carry a burden of from 3 to 4 feet.

For this work it was formerly the practice to use blasting powder, but recent developments have proved that certain grades of higher explosives are better adapted. The experience of the majority of our customers who have tried it is that a permissible explosive, such as our Monobel No. 1 or No. 6, will give best results. These powders were manufactured originally for use in coal mines where gas existed, and were made with a view of reducing the fumes to a minimum. While they are sufficiently strong to thoroughly blast the clay, they have a faculty of giving a better lump condition than a quicker acting explosive. It also has an advantage of having a greater number of cartridges to a case than a number of other high explosives.

An Enjoyable Dinner.

Tuesday evening an informal dinner was given at the Jefferson Hotel. After the good things were disposed of, President Kanengeise r,acting as toastmaster, introduced Harry B. Hawes, a prominent attorney of St. Louis, who as a member of the state legislature has been doing yeoman service in the good roads movement. He told in an entertaining way the trials and tribulations incident to the establishment of a better road system in that state, and predicted that in the near future there would be an effective working combination among township, county and state authorities, which, backed by Federal aid, would prove of vast benefit to Missouri.

Chairman Kanengeiser next introduced Mr. J. C. Travilla, the former street commissioner of St. Louis, now associated with the Dunn Wire-Cut-Lug Brick Company. "Jim" is a noted good roads advocate. While he admitted that brick roads are the best roads of the world, he declared there was a place for all kinds of pavements, and urged that the advocates of the various road materials recognize this fact and lend their influence to road improvements of all sorts.

Theodore A. Randall, secretary of the N. B. M. A., was called on by the chairman to close the "talkfest" and did so with a fitting story or two, when the visitors adjourned to the lobby and resumed their shop talk. Many compliments were paid Eben Rodgers, who had charge of the entertainment program.

A Trip to the Clay Plants.

Wednesday morning automobiles were supplied by the local committee, and the party was taken to the paving brick plant of the Hydraulic Press Brick Company, where, under the guidance of the megaphone man, Prentice Trowbridge, and his assistant, genial Tom S. Rouse, the visitors were shown through this and the adjoining plants of the company, a portion of which extends under the magnificent King's Highway bridge, which is a connecting link for the boulevard system of the city of St. Louis. This territory which is known as the "Railroad Valley," is the habitat of four Hydraulic plants and a number of other large clayworking establishments.

The Hydraulic Press Brick Company is one of the largest and best equipped brick manufacturing concerns in the world. It owns and controls immense quantities of multi-utility clays which enables them to make a variety of building brick, paving brick and enameled brick of high quality.

The view of these plants, from the top of the bridge, is, to the brick man, something beautiful to behold, to-wit: East of the bridge the No. 3 plant and west of the bridge, in close proximity, are located the enameling house, with its adjunctive departments. A little north of the same is found the No. 11 plant, and facing the "Manchester" road is situated the No. 3 plant. But what was one of the interesting features to the writer was to see each yard floating its individual "Old Glory," and it was ascertained that the employes of each yard, of their own volition and among themselves, collected sufficient money to buy and pay for a fine large flag, the company erecting the necessary poles and equipment. The loyalty of the company's employes is surely to be commended, when it is figured out that the various nationalities of their employes stand as a unit for their home and adopted country.

The No. 5 plant is equipped with a mangnificent line of their celebrated "Graves" hydraulic brick machines, used for making their celebrated lines of face brick, which speak for themselves as regards their perfect quality. There are a five-mold machine adapted to make bricks of all sizes and depths, two ten-mold brick machines used for making the standard shapes and also a two-mold "Pony" press used for making ornamentals and specials. From these presses the green brick are transferred to a nine-double track-drying tunnel, having a capacity of 300,000 brick, in which the drying is completed in from 24 to 72 hours, depending on the material, shape and thickness of the green product. It is practiced on this yard, because it had been found that it is better to take the drying shrinkage out of the brick before setting, and in that way reduce the burning shrinkage only to burning shrinkage, and in this way insure better results, and the finished product of the burned kilns proves the contention is right.

The plant is equipped with twenty-two down-draft kilns of their own design and also four up-draft kilns. These kilns when filled for the last round of the season give practically a storage capacity of 3,500,000. To show the scope of this plant, the following figures are submitted as possibilities: Nine kinds multiplied by ten shades, on the average, multiplied by four sizes, standard Roman, Norman, English, show 360 possibilities.

From there we passed by the enameling house; and, judging from the activities in and around the same, the enameling house was adding its share to the prosperity of the company.

The next plant visited was the No. 11 plant, which was found to be very busy. As usual the visit was started at the clay supply, which is brought in from Malcolm Station, utilizing the company's equipment of ninety cars. The cars are brought in on a siding into the works and relieved of their burden through drop-bottom doors, feeding the clay directly into a battery of four crushers, and from there into four dry pans, then over screens into hoppers in the usual way.

A very satisfactory "Safety First" device at the car unloading point consists of a strong belt, which the unloader attaches to his waist, not interfering with his shoveling; yet, should he slip down into the drop-bottom hole, will be prevented from being caught in the crushing machinery underneath. The brick machinery equipment consists of a 60,000 Raymond, a large and a small Bonnott stiff mud machine, all of which run at a rather slow speed, to insure quality of product. All of these machines are steam lubricated at the mouthpiece and work satisfactorily on their clay. From there the brick are passed through a thirteen-double track tunnel, about 110 feet long. From there they are moved on a very extensive cooling track system, thus at all times making setting convenient for the setting gangs, which in part accounts for the very small waste in the green paving brick.

The burning equipment consists of sixteen square down-draft kilns of the company's design, holding 100,000 paving blocks each, are set thirty high and finished up at a settle of from 17 to 20 inches. The company has a complete standard rattler testing outfit and makes it the practice to rattler test every kiln of brick, believing it to insure more careful sorting.

A very satisfactory mechanical carrier adapted for speedy drawing of the burned kilns is in use on this plant. It consists essentially of a traveler, to which are attached at predetermined points, hanging arms adapted to retain from three to four paving blocks. These arms, in passing through the kiln, are loaded with their allotment of brick as they pass by the loaders, and in this way are forwarded over the route, and thus the unloading can be done either at piles, wagons, trucks or cars, in a constant stream.

A "unit" system of paving brick delivery is in an experimental stage on this plant. The plan is about as follows: A small flat car (its size being determined by the large power truck which will be used in connection) is loaded directly from the carrier, then the loaded car is transferred to the truck bed, which is supplied with proper rails to receive the same. When the truck arrives at its destination, an incline is placed conveniently to the truck and the car as a "unit" is deposited at the job. The experiment promises good results, for speedy delivery, with bricks not being battered by unloading at the same, also making it easy for a recount.

A unique system of pier-setting on top of green bricks attracted attention, its purpose being to cause flash brick, at the same time to act as retainer to keep the work from rolling.

From there the next plant visited was the No. 3 plant, which is equipped with Raymond machinery to make hollow tile pavers, builders, etc., and at the same time a hydraulic press is also installed for making dry clay wares. There are also the adequate numbers of drying tunnels and kilns to be found on this plant, sufficient to avoid unnecessary crowding, thus insuring good results at all times. As an illustration of what the building public now demands of the brickmaker, the following mottled job is offered:

Two kinds of clays are mixed in varying proportions as the grinding goes on; the product is set in such a way that the ware can flash on the heads alone, faces alone, all around, partly on face, or head. The finished ware is sorted to its various shades, then when loading the bricks are mixed as regards position of flash and shade, thus producing when laid up in the wall an artistic color and shading effect, which could not be produced otherwise, especially if the brick had been loaded directly from kiln to car, as then the wall would only show a potted effect.

On the Raymond machine on the day of our visit, we saw the mode of making their so-called smooth-faced Venetian red, in which an ingenious polishing effect on the face of the brick is used, and the resultant product reminds one forcibly of the so-called oil-polished stock brick made extensively in Germany.

This about finished up the sight-seeing, which was greatly enjoyed. But for a finale, after Mr. Trowbridge stating that he had been with the company for twenty-seven years, we asked him what he considered the keystone of success in the brick business. He emphatically stated: "The burning; for if such results are poor all the care, time and experience given the primary product are wasted. Thus I give particular attention to the burning part of the manufacturing scheme."

Believing that it is wise to adopt the policies of a successful manufacturer, it is herewith attempted to impress upon our brickmaker friends: "Go thou and do likewise."

RECENT PATENTS

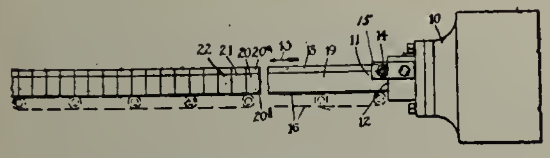
Compiled by Our Special Representative, Ira M. Jones, Patent Attorney, Washington Loan and Trust Building, Washington, D. C.

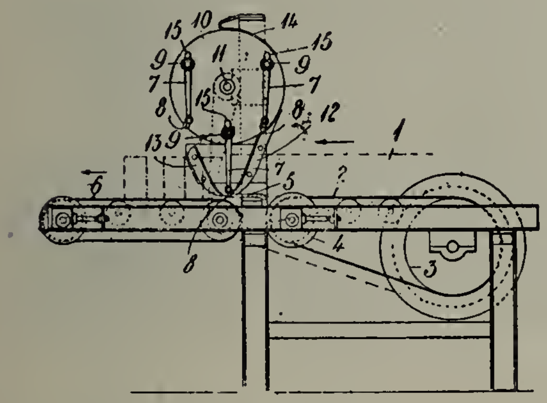
1,214,668. APPARATUS FOR CUTTING BRICKS AND THE LIKE FROM CONTINUALLY-FED MATERIAL. Nils Frederiksson, Svedala, Sweden. Filed Oct. 21, 1914. Serial No. 867706. (Cl. 25—110.)

1. In a machine of the character described, the combination of a rotary support, shafts secured with one of their ends to the support and having their other ends free, and pendulous cutting frames of less length than the distance between the shafts and loosely threaded on said shafts, for the purpose of an easy removal of the frames from the shafts and of allowing each frame to swing around its shaft without being hindered by adjacent shafts, substantially as set forth.

1,214,706. TILE-FORMING APPARATUS. Lewis Clifford Nelson, Coffeyville, Kas., assignor to Ludowici-Celadon Company, Chicago, Ill., a Corporation of Illinois. Filed Aug. 14. 1915. Serial No. 45529. (Cl. 25—43.)

1. A pair of molding dies for tile or the like, a portion of one of which is adapted to project beyond the face of the other in the direction of the closing movement of the dies along one edge when the dies are closed to make a tile, whereby the corresponding edge of the tile will be trimmed during the molding operation.


1,214,793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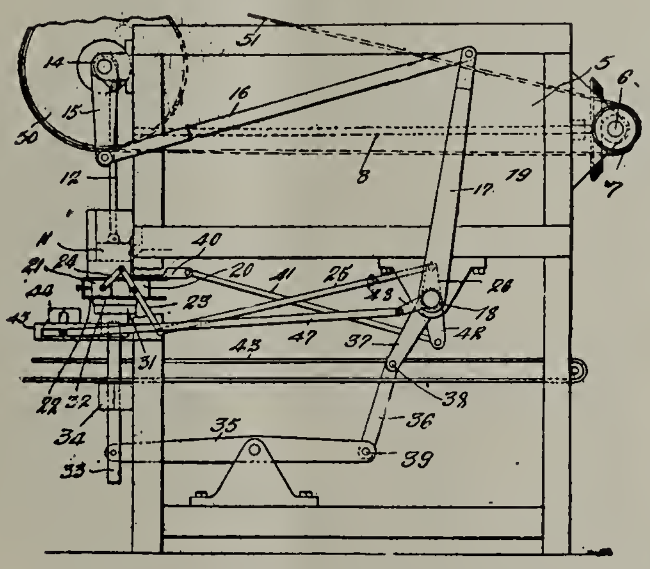
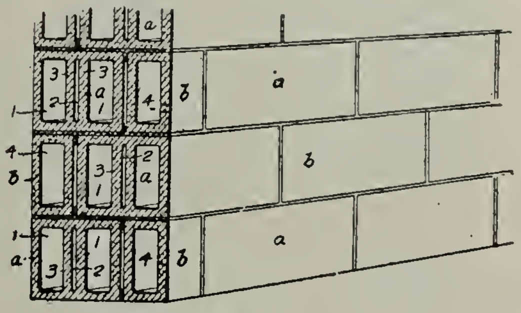

1,215,215.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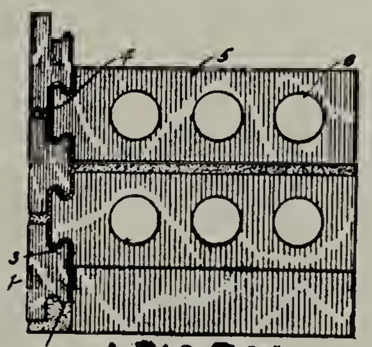

1,214,826

1,214,793. METHOD OF MANUFACTURING ENAMELED BRICKS. Bernard Jacquart, South River, N. J. Filed May 27, 1915. Serial No. 30733. (Cl. 25—156.)

1. The method of manufacturing bricks, in the wet or stiff mud process, which consists in wholly severing a face portion from the wet brick-blank, simultaneously baking the face and remaining refuse portion while in pressed intimate contact with each other, and then after baking wholly removing the face portion from the remaining refuse portion, along the line of severance made while in wet condition.

1,214,826. WALL STRUCTURE. Willard D. Richardson, Columbus, Ohio. Filed Dec. 21, 1914. Serial No. 878258. (Cl. 72—21.)

A wall structure having a relatively thin facing veneer and made up of a plurality of superimposed backing units of such thickness as to extend through and form the burden bearing portion of the wall and of the height and length of a standard brick and having parallel upper and lower faces, each of said units having a longitudinally extending, centrally disposed dovetail rib formed along its front face, the facing veneer comprising thin slabs of facing material of the length and height of a standard brick and having longitudinally extending dovetail ribs centrally disposed upon their rear faces, whereby when the dovetail ribs of the facing slabs are disposed between the dovetail ribs of the superimposed backing units said slabs overlie the joints betwen the said units to prevent the formation of a mortar joint completely through the wall, said slabs being so disposed longitudinally of the backing units that the vertical joints between the slabs lie out of alignment with the vertical joints between the backing units.

1,214,964. BLOCK OR SLAB FOR REINFORCED HOLLOW-WALL CONSTRUCTION. George E. Small, Richmond Hill, N. Y. Original application filed May 6, 1915. Serial No. 26209. Divided and this application filed Sept. 15, 1915. Serial No. 50725. (Cl. 72—39.)

1. A construction block or slab having a pair of projecting wing portions and on the inner side thereof a lengthwise extending centrally located beam portion, the beam portion of each block having a face adapted to abut against the wing portions of a pair of companion blocks, said beam having at intervals in its length recesses therein located in the abutting face thereof and reinforcing means located in said slab at intervals and having loops or eyes projecting into said recesses.

1,215,215. BRICKMAKING MACHINE. David Strickland, New York, N. Y. Filed March 18, 1911. Serial No. 615198. Renewed June 26, 1916. Serial No. 106059. (Cl. 25—101.)

In a brickmaking machine, the combination with a mud spout, of a separable mold open top and bottom and fixedly supported below the mud spout, a pallet support movable toward and from the bottom of the mold in a vertical path below the bottom of the mold, and mechanism for actuating the mold and the support in sequential timing for opening the mold and lowering the pallet and the molded brick from the mold.

SHE WOULDN'T.

"I've been reading an article on electricity, John," said the wife as she laid down a copy of a technical magazine which she had been perusing. "And it appears before long we'll be able to get pretty near everything we want by just touching a button."

"It will never pay here," growled the husband. "You would never be able to get anything in that way."

"Why not, John?"

"Because nothing on earth would ever make you touch a button. Look at my vest!"—McGraw Equipper.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

A CORRECTION.

Editor Clay-Worker:

Referring to my paper on "The Richardson Continuous Kiln," which you recently published, in order to correct any misunderstandng arising from the footnote printed, we should like to have you publish a statement that this work was not the result of any investigations conducted by the University but represented merely the experience of the writer while in the employ of the Ceramic Supply and Construction Company.

We have received a letter from the International Clay Machinery Company in which they point out that the footnote as printed might be misleading. To prevent any such misunderstanding, would you kindly make this plain in a short published notice?

As the article did not represent work done while at the University, and as it is not the policy of the department to make any particular recommendations, it would be unfair to allow any of your readers to draw such a conclusion.

With kindest personal regards, believe me,

Yours very truly,
H. C. ARNOLD,
Instructor in Ceramic Engineering.
Urbana, Ill., May 9, 1917.

A SMALL BRICK HOUSE AND GARAGE COMPETITION ON THE PACIFIC COAST.

Editor the Clay-Worker:

We believe you will be interested in the program enclosed for competition for a small house and garage to be built of brick and other clay products. We would appreciate whatever publicity you may give this. We will be glad to keep you posted from time to time as to the progress made and results obtained if desired. It is the hope of the writer that at least 50,000 booklets including all prize winning plans and several of those given honorable mention may be gotten out and distributed throughout the state and coast. It is the intention of the contributors to carry out some such plan and to determine by bids both for brick and for frame the difference in cost and the per cent. of increase of brick over frame.

It has been proven that brick houses can be built at from 6 to 12 per cent. above the cost of frame in many parts of the country. We do not, however, know whether that will apply to conditions in California or not, but we will know shortly.

Yours truly,
LOS ANGELES PRESSED BRICK CO.
HOMER FROST, President.

Editor's Note: The competition mentioned above was open to all architects and draftsmen on the Pacific Coast. The house and garage to be built of brick and other clay products on a level lot in a town or suburb of a large city, the width of lot to be not less than fifty feet, nor more than 100 feet, and not to exceed 150 feet in depth. The house was to contain an entrance hall, living room, dining room, kitchen, pantries, porches, etc., three main bed rooms with two baths and two sleeping porches and one other sleeping room and bath for servants. The garage was to accommodate one machine, wash racks, etc. The total cost of the house, exclusive of land was not to exceed $8,500, this to include excavating, heating, plumbing, lighting fixtures, etc., but to exclude planting or gardening effect. The total cost of the garage was not to exceed $750.00.

Houses of this type of construction have been built in California for 25 cents per cubic foot, so that rate was to be taken as a basis for computing the cost. No design whose cubical contents exceeded 34,000 was to be considered. The garage was to be figured at 18 cents per cubic foot. The prizes offered in this competition consisted of six, ranging from $500 to $50, there being a total fund of $1,150. The competition is to close June 1, 1917.

AN ATTRACTIVE BRICK YARD OFFICE.

Editor of The Clay-Worker:

I am pleased to send you a photograph of our new brick office. It is very neat and substantial in appearance and we are quite proud of it. We have recently added another Underwood gas producer to our equipment and are going to build four more thirty foot round down draft kilns. This will enable us to increase our output to 50,000 brick per day. Hope you can pay us a visit during the coming season and see for yourself how nicely we are getting along with our gas-fired kilns.

Factory Office, U. S. Brick Co., Tell City, Ind.

Very respectfully,
UNITED STATES BRICK COMPANY,
C. F. HERMAN, President.
Tell City, Ind., May 11, 1917.

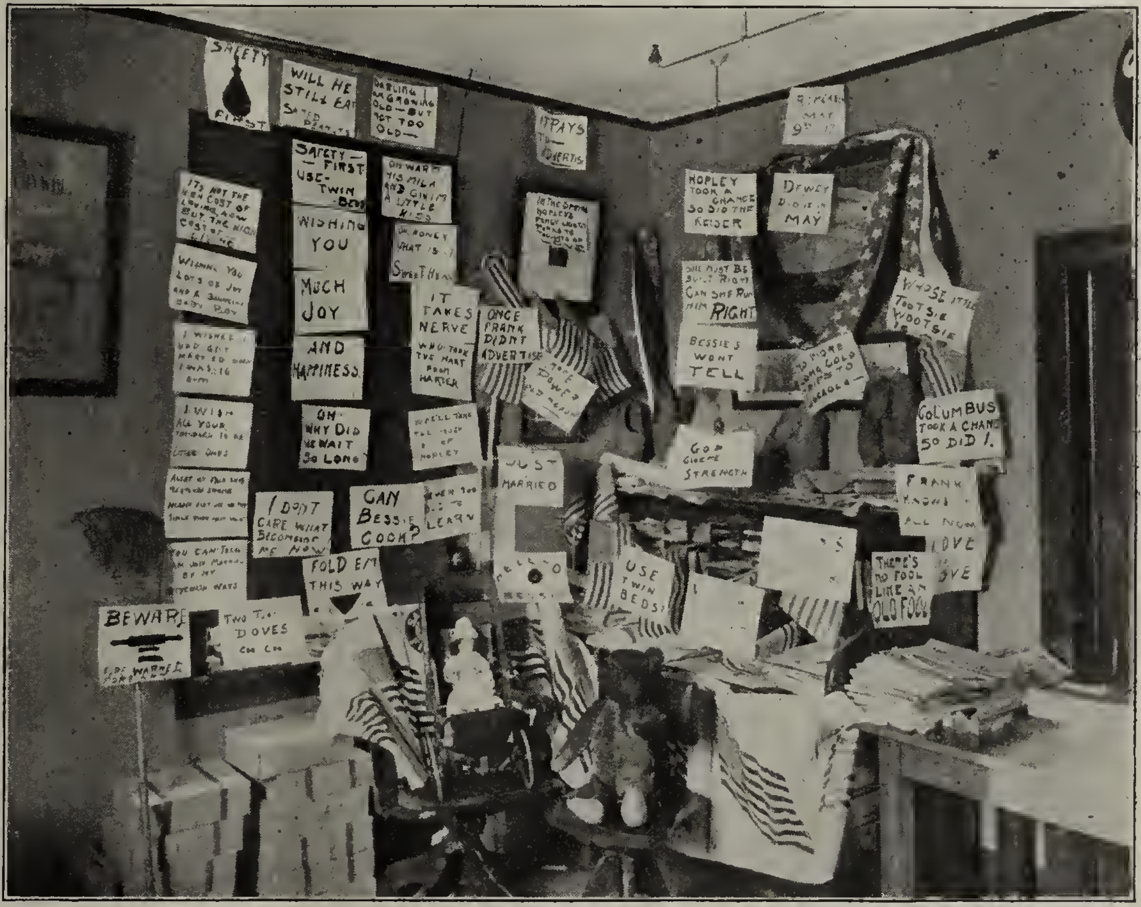
A FAMOUS OLD ROAD.

In these days when so much is written about military roads it will interest road builders with a historical bent to know that a careful study has been made of one of the most famous roads in the country, that built by Braddock's men during their expedition against Fort Duquesne. It began at Fort Cumberland, Md., and followed for the first half of its length approximately the same route as the old national road built by the United States about one hundred years ago, branching away from it near Jumonville, Pa. It then ran near Connellsville, Mt. Pleasant, Madison and Stewartsville to the battlefield at Braddock where the expedition came to its disastrous end. The road was nearly or quite 110 miles long. It was laid out by three engineers accompanying the army and was built 12 feet wide. Work on it began on May 30, 1755, and on July 9 it came to an end with the defeat of the British army. The location of the road has been determined by the investigations of John Kennedy Lacock of Amity, Pa., who has devoted a large amount of time to a study of the ground and a search of old records throwing light on the subject. In some places all traces of the road have disappeared, in many places its route is easily followed, and a few portions of it are incorporated in roads now in use. It is of particular interest to the engineer because, like many of the military roads of that and later days, it contained long, straight stretches where the road builder of today would introduce curves in order to reduce grades.

THE SURPRISE OF ALL SURPRISES

IF SOMEONE with authority would tell us the submarine question had been solved for all time, we would, of course, be surprised, if some one would walk into our office and declare that the war was over and peace everlasting was assured, we would be more than surprised, or if some one should tell us that gasoline could be purchased for five cents a gallon, that every brick manufacturer was asking $20 for common brick and $50 for front brick, that no other building material was being used other than clay products, that there was no more fire waste, that fairies were real, that Santa Claus was a sure-enough-honest-to-goodness personality, that the mosquito had no sting or that the moon was made of green cheese, why, of course, we would be even more than absolutely surprised, we'd think the fellow crazy. Now what do you think is our feeling upon hearing the announcement that that sedate bachelor, that modest, get in a corner, hide-away fellow Frank L. Hopley of the American Clay Machinery Company is really, cross-my-heart married. Surprised in this case is spelled with a large S, but, of course, we don't think he's crazy. We think he made the best move of his life for now he can appreciate the smiles, sweetness, serenity or sympathy of a sweetheart, all of which the big S we mentioned of course symbolizes. Yes, "Frank" is now a benedict. He married Miss Bessie Harter of Oceola, Ohio, the second of May. We presume he had a very quiet wedding for he knows the advertising game from A to Z and naturally controlled the situation, but when he gets back to his office he has a great big surprise in store for him. The office force of the American Clay Machinery Company decorated his desk and the walls of his office as shown in the accompanying illustration. Frank is a good joker, enjoys a good joke on any one, himself included, so we feel sure that he will laugh over the decorations for many months to come. We sure would have enjoyed putting up a few placards ourselves. The Clay-Worker force joins with the American Clay Machinery Company's force in wishing Frank L. Hopley and his bride much joy through all the coming years.

The Victim.
Frank L. Hopley, Bucyrus, Ohio.


SAFETY FIRST
WILL HE STILL EAT
DARLING I AM GROWING OLD—BUT NOT TOO OLD—
IT PAYS TO ADVERTISE
SAFETY — FIRST USE — TWIN BEDS
WISHING YOU MUCH JOY AND HAPPINESS
IT TAKES NERVE
ONCE FRANK DIDNT ADVERTISE
OH WHY DID HE WAIT SO LONG
I DONT CARE WHAT BECOMES OF ME NOW
CAN BESSIE COOK?
FOLD EM THIS WAY
BEWARE
TWO TURTLE DOVES
JUST MARRIED
USE TWIN BEDS
GOD GIVE ME STRENGTH
HOPLEY TOOK A CHANCE SO DID THE KEISER
DEWEY DID IT IN MAY
BESSIE'S WONT TELL
COLUMBUS TOOK A CHANCE SO DID I.
THERE'S NO FOOL LIKE AN OLD FOOL

Office Decorations That Will Greet "Frank" on His Return from His Honeymoon Trop.

PUT MILITARY PRISONERS AT WORK ON AMERICAN ROADS.

More than a hundred years ago quite a number of German citizens who had been captured while taking part in military operations in this country, were put to work building roads in Alexandria and other American towns where they were detained. They liked their surroundings so well that a large part of them stayed here and became American citizens after they were free to return to their native country. Just at the present time there is a great scarcity of labor on American roads. There is also a great surplus of Germans and Austrians interned in France and England, where the problem of feeding and guarding them and keeping them out of mischief is a serious one. This problem of interned prisoners would be greatly relieved by sending a few hundred privates and non-commissioned officers to this country on each returning ship to repeat the work of the German prisoners of a century ago, not only on our roads but also in other classes of labor. Naturally most of them will elect to stay in this country, once they are here and see the opportunities which the United States offers to the industrious and sober worker. While here as prisoners they can be employed on the public works which are now suffering from the high price of labor and can be credited with a certain sum for each day's work which will enable them to bring over their families at the close of the war. The President has said that this was not a war against the German people and the suggested plan will make this clear to the misguided men who are being sacrificed to the personal ambitions of an over-conceited ruling caste.

With the youngsters going into the army it is up to the older fellows to shoulder a bigger share of the burden of industry these days.

BRICK AND BUILDING NEWS OF SOUTHERN INDIANA.

THE BRICK MANUFACTURERS of Evansville and towns in southern Indiana report that trade has been fairly active during the present spring and present indications point to a very good business during the summer and fall. There is considerable building going on in this city, and while the building operations are not as active as in some years gone by, brick men say that they expect to have plenty to do. The city has just witnessed a campaign in which $500,000 was raised for the purpose of bringing Moore's Hill College from Moore's Hill to Evansville, and to this sum the educational board of the Methodist Episcopal Church will add another half million dollars. The college building will be built of brick. Two new churches are being planned here for this season and several churches will build additions.

H. C. Kleymeyer, general manager of the Standard Brick Manufacturing Co., and John Andres, secretary and treasurer of the same company, were active workers in the campaign to raise the money to bring Moore's Hill College to Evansville and both gave liberally to the fund.

The contract for a new school building at Booneville, Ind., that will cost $50,000, was let a few days ago. The school will be built of Booneville brick.

The Mayfield Clay Co., of Mayfield, Ky., has filed articles of incorporation, the capital stock of the concern being $100,000, with a limited indebtedness of $25,000. The incorporators are J. A. Watkins, W. M. Reed, H. C. Overby, H. D. Hughes, R. B. Phillips and R. R. Winston. The company will operate extensive clay mines in Graves county, Kentucky, and will have their headquarters at Paducah, Ky. The clay is said to be of fine quality and will be used in manufacturing chinaware and tile.

Michael D. Helfrich, of the Sanitary Pottery, Evansville, was one of the large contributors to the fund raised to bring Moore's Hill College to the city.

A few days ago the county commissioners of Knox county, Indiana, let the contract for several roads in that county and two of the roads will be constructed of brick. Several cities in southern Indiana will build brick streets this season.

Anton Vogt, who was formerly superintendent of the Cannelton Clay Products Co., at Cannelton, Ind., has gone to Mt. Pleasant, Mich., to accept a good position in a brick and tile concern of that city. His family will follow him in a short time. Mr. Vogt, who came originally from the state of New York, is an expert in the burning of fire brick.

A few days ago state inspectors visited the two brick yards at Winslow, Ind., and found the yards in first-class condition. Their visit was in connection with the state "clean-up campaign."

The Cannelton Sewer Pipe Co., at Cannelton, Ind., has turned gardener and the vacant lots around its plant have been planted in potatoes and the crop will be cultivated by the employes of the company, who hope to help reduce the high cost of living in that section.

The immense 14-ton Boyd brick press recently purchased by the Cannelton Clay Products Co. from Chisholm, Boyd & White, of Chicago, has arrived and been properly installed in the plant. The machine complete weighs 28,000 pounds. It casts four brick at a time, making thirty-three a minute or an average ten-hour daily capacity of 20,000. The brick is made from dry clay. A 9-foot dry pan is also being installed in the plant. For the present time the company is making fire brick only and many orders have been booked ahead by the concern. Later on, it is the intention of the company to manufacture other brick for building and paving purposes. The present product of fire brick is giving the best of satisfaction to the trade. The company is spending about $10,000 in improvements, having recently increased their capital stock from $20,000 to $30,000.

On April 10, a flag raising occurred at the plant of the city waterworks, Evansville. John Andres, secretary and treasurer of the Standard Brick Manufacturing Co., assisted in the exercises, he being one of the trustees on the waterworks board.

The Standard Brick Manufacturing Co., of Evansville, is furnishing the brick for the station of the Union Gas and Electric Power Company at Cincinnati, Ohio, about three-quarter million brick being required for their part of the work. The company is furnishing the face brick. The brick company is rushing the work on their new brick plant that is being built on the Illinois Central railroad east of the city, and it is expected the plant will be completed this season. The new factory will have a capacity of 50,000 brick daily and will use an extra good grade of surface clay. At the plant of the company that is located on the Mt. Vernon road, near the city, shale brick are made, while at their First avenue plant they manufacture sand mold brick. At the old Uhl plant that was taken over last season by the Standard Brick Manufacturing Co., building brick and hollow tile are made. The Uhl plant is being rebuilt by the company and they recently purchased eighty acres of land near the city.

As a result of a conference held in Evansville a few weeks ago between brick manufacturers of this city and representatives of several railroad companies, it is expected that a better rate will be afforded the brick manufacturers and shippers in this section in a short time. According to local manufacturers, Evansville is now branching out and the home-made products are sold in a wider range of territory and as a result, better freight rates are required. The car shortage has been handicapping local brick manufacturers to some extent for the past several months. The situation at this writing is some better, yet it is not what the manufacturers and shippers would like to have.

H. C. Kleymeyer, general manager of the Standard Brick Manufacturing Co., has been assigned to some of the most important committees in the Chamber of Commerce, that was organized here a little over a year ago, and which is doing a great work for the city. Mr. Kleymeyer is one of the most public-spirited men in the city and is a great booster for Evansville.

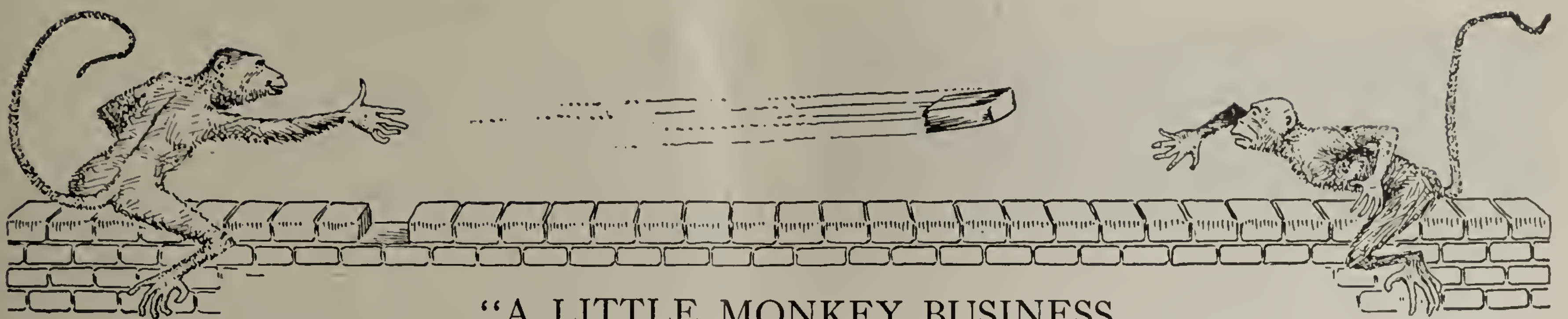
The little city of Bicknell, Ind., near Vincennes, Ind., is enjoying a building boom this season, and recently the contract was let for the erection of fifty dwelling houses in that place. At Edwardport, a short distance away, a large power plant is being erected that will require a great many brick. Several other towns in southern Indiana are also enjoying building booms. Two new traction lines are being planned from this city this year, one line to run to New Harmony, Ind., and the other to Poseyville. The survey for both lines has been completed.

Brick manufacturers in this section state that thus far the war has had little or no effect on their business, and while they are of the opinion that the war may last another year or longer they do not believe that the business of the central west will be vitally affected. "Do not talk war, but push business," is the motto of the brick men in this section, and the slogan is a winner.

The bricklayers of Evansville were recently given a slight increase in wages and a strike was avoided. The men were receiving 70 cents an hour and asked for 75, but a compromise was reached at 72½ cents an hour.

A. HOOSIER.

In connection with the idea of preventing strikes on public utilities it may be said that practically every industry serves the public in some way, and almost any kind of a strike is an inconvenience to the public as well as a burden upon the industry and the men. So why limit the idea of preventative scope?



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Dwindling.

She—"The checks you give me are getting smaller each time. Why is that?"

He—"Why, it's-er-because of the scarcity of paper."

* * *

No Amateur.

Judge—Were you ever arrested before?

Raggles—Honest, now, judge, do I look like I was a bud jest makin' me dayboo?—Columbus Citizen.

* * *

Particular.

"Casey is me pertickeler frind, Oi'd have ye know."

"G'wan! If he was pertickeler he wouldn't be yer frind."—New Orleans Times-Picayune.

* * *

Isn't It, Now?

It is quite patent that the old injunction, "Eat, drink and be merry," was coked up before these 'tarnel high prices went into effect. How can a fellow be merry after the eats and drinks bill comes along?

* * *

She Knew.

Hub—One night while you were away I heard a burglar. You should have seen me going downstairs three steps at a time.

Wife (who knows him)—Where was he, on the roof?—Boston Transcript.

* * *

The Reason Why.

An English militant crusader strolled into a barn where a young man was milking a cow. With a snort she asked: "How is it that you are not at the front, young man?"

"Because, ma'am," answered the milker, "there ain't no milk at that end."

* * *

What Would Happen.

Teacher—Now, if I paid one man $2 a day for seven days, another $3.50 for ten days, another $4.75 for six days—

Reddy Backrow (whose father belongs to the union)—You'd have the durndest strike on your hands you ever saw, teacher.—Irish World.

* * *

Ineligible.

"Is dis where dey wants a boy?"

"It is; but it must be a boy who never lies, swears or uses slang."

"Well, me brudder's a deaf mute; I'll send him round."—Topeka Journal.

* * *

Why He Smiled.

"You look very smiling this morning, Toner," said Bailey.

"I guess I ought to be. I went to a fortune-teller last night and she prophesied immediate financial reverses," chortled Toner.

"I fail to see anything very joyous in that," said Bailey.

"You would if you knew anything about my finances," said Toner. "I tell you right now that if they don't reverse pretty quick I'll be busted."—New York American.

His Chance.

"Miss Nora, if it wasn't for Tirrence O'Brien that do be coortin' ye, I'd be after havin' somethin' to say to ye mesilf th' night."

"It's very considerate ye are, Mr. Mulligan, but did ye niver hear that prisint company is always accipted?"—Dallas News.

* * *

Quits.

"Didn't you promise never to do it again?" sternly demanded the parent.

"Yes, sir."

"And I said I'd whip you if you did, didn't I?"

"Yes, dad, but as I didn't keep my promise I won't hold you to yours."

* * *

She Knew.

"My dear," called a wife to her husband, who was in the next room, "what are you opening that can with?"

"Why," he said, "with a can opener. What did you suppose?"

"Well," replied his wife, "I thought from your remarks you were about to open it with prayer."

* * *

The Breath of Scandal.

"Yes," said a lady of high social distinction at the Colony Club in New York. "I dearly love a Bronx cocktail before dinner, but I never take one. The odor of the gin stays on my breath for hours, and my husband doesn't like it."

"Only too true!" stated Beatrice Herford, the society monologuist, dreamily. "The wages of gin is breath."—Saturday Evening Post.

* * *

Guaranteed.

A man purchased some red flannel shirts guaranteed not to shrink. He reminded the salesman forcibly of the guarantee some weeks later.

"Have you had any difficulty with them?" the latter asked.

"No," replied the customer, "only the other morning when I was dressing my wife said to me, 'John, where did you get that pink coral necklace?' "—Tit-Bits.

* * *

Just a Little Mixed.

Everything was in readiness. The groom, best man and the minister were gathered in the vestry. The organist began to play and the minister started for the door.

"Wait one moment, doctor," called the nervous groom. "Is it the right or left hand the ring goes on?"

"The left," hurriedly replied the minister.

"And, doctor, is—is it kisstomary to cuss the bride?"

* * *

Making a Deal.

"Doctor, I've got a little money saved up."

"Yes."

"And I feel that I can afford an illness of some sort."

"All right. Perhaps we can make a deal."

"That's just it. I'm willing to pay you a reasonable fee, but you're not to get it all. Understand me, I don't want an operation this time. What I want you to do is to order me South for several weeks, where I can play golf."

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVII. MAY, 1917. No. 5.

My Country, Right or Wrong—My Country!

CURRENT COMMENT.

Business as usual—

* * *

Be a factor in your business and not merely an incident.

* * *

Many a big business is built up from the mastering of little details.

* * *

We can't win the war by arguments, and many of them are useless anyhow.

* * *

And once upon a time they burned corn for fuel out in Kansas, and sold wheat for 40 cents a bushel.

* * *

Getting additional help at the clay bank this year will be largely a matter of turning to power-driven appliances.

* * *

Fussing about an accident after it happens doesn't help much—do the fussing before hand as a preventative measure.

* * *

The U. S. Bureau of Fisheries has been demonstrating that sharks skins can be utilized for leather. Now if they will just devise some painless method for skinning the sharks who have for so long been fleecing the human lambs we can all be happy.

* * *

There are already too many amateur stragetists trying to direct the war. Let us talk business, not war.

* * *

Have you drain tile folks been reminding the farmers that one good way to increase the crop production is by tile draining?

* * *

Building operations may be curtailed some by war conditions but what building is done should be done right by being built with brick.

* * *

Common sense is that thing which leads man to eat when he is hungry, drink when he is dry, kick when he is hurt, and to speak up when he wants something.

* * *

It is too much operating with not enough co-operating that makes the biggest hazard in the brick business, and often turns what should be profit into sad experience.

* * *

If there are good roads in your territory it is time to try out motor trucks to help with the matter of transportation, and if the good roads are lacking it is time to do some road building.

* * *

The talk of taking a lot of our railway equipment to Europe reminds us, if we needed reminding, that we can make good use of considerable more equipment on our own railroads than seems available.

* * *

Shouting and marching are natural manifestations of feeling or enthusiasm, but they are really not productive of the necessities of the present occasion. It takes serious thought and work to solve the problems of the day.

* * *

There was a timely reminder injected into the discussions at the National Convention by Elish K. Kane, that the desirability of subsidiary association in different branches of the trade does not alter the fact that the big organization of all interests is a necessity that grows in importance as the different lines increase in numbers and strength.

SOME ADVERTISING NERVE.

The dairy people have recently displayed a species of nerve in advertising that, at first, seemed rather startling, and is withal so impressive of foresightedness and daring that it merits thoughtful attention on the part of the brick people who have been rather timid about advertising.

One would naturally assume that with butter prices almost sky-high and milk prices, also, and the demand easily in excess of the supply there would be no need whatever to advertise butter extensively. Yet there appeared in a recent issue of the Chicago Sunday Tribune a full page spread advertising butter, by the National Dairy Council, which is composed of 280,000 dairymen and people in kindred lines.

The first natural question on seeing this startling spread of bread and butter advertising in the present time of food shortage is that of why, and what sense there is in advertising butter right now. The whyfore is brought out between the lines in the advertising itself by a series of blackface headlines, stating that there is no substitute for butter.

This means that the dairy people are looking ahead. They are not willing to rest on an urgent trade at high prices at the present time, but appreciate the fact that there is a future to be considered, and the purpose of this advertising is to provide for the future. The high prices are leading the public, and even the health authorities, to a more favorable consideration of substitutes for butter, which may in time result in such a considerable encroachment of substitutes as to impair the market for butter itself. It is this which makes the underlying reason for the butter advertising, and it is also this which furnishes an example of foresightedness which might well be emulated by the brick people.

Because brick is comparatively scarce and commands fairly good prices already in some sections is no guaranty within itself that these conditions will always prevail. In other sections where the war conditions have served for the time being to put a damper on building operations there is also the future to consider as well as the present trade to be met. Advertising is not a short-sighted game, nor one which is played for the present only, but the right conception of it is found in looking to the future.

The dairy people have displayed a wonderful example of nerve and foresight in making their big advertising spread at the present time. It is a more daring thing perhaps than we may ever expect out of the conservative element of the brick trade, but it should serve to set us thinking and to looking further ahead in the brick boosting game. There is no substitute for brick, that is no real substitute, but there are many inferior things in the way of building material that can and will be used unless the brick trade manifests an order of enterprise which makes itself known through active exploitation for the good of the future as well as the present.

INSURING EMPLOYES.

Beginning with April 1st the management of the Elk Fire Brick Co., St. Mary's Pa., put into operation a plan for carrying insurance on its employes for the benefit of their dependents without any cost whatever to the employes.

The plan includes all employes who have been continuously with the company for three months or more, and the insurance is of the group order in which medical examination is waived.

The amount of insurance carried on each employe is $500, which is cumulative and increases to $600 January 1st, 1918; that is for all employes who have been insured before July and are still in the employ of the company at that time.

The Elk Fire Brick Co. pays all the cost of the insurance and it is the employe's privilege to designate who the policy will be made in favor of. It is all a part of the general idea of progressiveness and surrounding their employes with all practical comforts and safeguards. There is no deducting from wages and it has no bearing on compensation in case of accidents or anything of that kind.

This is an order of preparedness that certainly ought to be appreciated by the employes, and is an experiment that will likely be watched with considerable interest by other progressive clayworkers.

THE HAULING PROBLEM.

The problem of hauling, involving not only local deliveries but railway hauls, is one of serious concern to the brickmaking fraternity this year and which has several interesting angles.

There has never been a time in the history of our railroads and industries when the railroads have fallen so short of meeting the demands made upon them in the way of transportation service. However, right now, the scarcity of cars and the difficulties of rail transportation are only a part of this hauling problem confronting the industrial world as a whole and concerning the brick trade as well as others. There is now a proposition of increased freight rates all around, the Adamson Law being the reason or excuse whichever you prefer to call it. The important fact is the railroads are asking for and starting to put into effect an increase of 15 per cent. in freight rates. Some of this is being done arbitrarily by roads within the limits of intra-state hauling while all of them are asking permission from the Interstate Commerce Commission to make a general increase of 15 per cent. This will add to the cost as well as the difficulties of transportation.

It is a reminder of the benefits of something that has been urged repeatedly in these columns, and that is our striving to take care of the near-by territory, because each brick man doing this with less shipping back and forth into each other's territory will shorten the long hauls. Meantime there are several other side angles to this hauling problem which merit attention.

One of these in the inland waterways as a probable means of relieving the burden of long hauls of heavy freight-like brick. We have talked a lot about inland waterway development, but we have not actually done enough of it. What we need is perhaps less talk and more doing of these good things that seem practical in the way of relieving traffic congestion by handling a larger share of freight accessible thereto over our inland waterways.

THE MOTOR TRUCK AS A FACTOR IN SOLVING THE HAULING PROBLEM.

Then we come to the motor truck and the good roads as companion factors in the haulage problem. The good roads are coming along at a fairly satisfactory rate. Also, meantime, the brick trade is developing the motor truck habit. All of which gives promise of helping out materially especially if the injunction is followed to cultivate the home territory for the disposition of as much as practical of the product.

The more venturesome users of motor trucks have learned that these have great possibilities in the way of hauling over distances which heretofore were impractical except by rail shipment. The truck has done more to reduce distance than anything else even in local territory hauls, hauls that would be considered long for a wagon and team are small matters for a truck with good roads. A matter of eight or ten miles is not much more to a truck than one or two miles, and it has been found that on good roads of twenty or thirty miles in many instances the truck can be made to replace rail hauls at a saving in freight cost and in this way it will at times eliminate at least one handling of the product, since the truck can be driven where delivery is wanted and is not confined to railway sidings.

There is promise of some interesting development in the problem of hauling brick during the next year or two, and much of this interesting development will very likely center around the motor truck and good roads. Both are commended for study. Good road development is something that has been and should be encouraged regardless of the brick delivery problem. These promise to be a sort of deciding factor in the brick hauling of the future with good roads and motor trucks one can not only deliver brick to farmers in the home territory but it may be found practical to make many deliveries which heretofore have called for the use of railroads. Moreover this is a phase of the hauling problem that in a way is in the control of the brickman himself, and in which he is not dependent upon the actions and activities of railroads. This point, of itself, is one of considerable importance. And the prediction is ventured here that the motor trucks and the good roads will do more to help solve hauling problems in the next few years than any other one agency.

FRONT BRICK TO THE FORE.

The one line of building brick which showed an increase during 1915 was front brick, with its increase of 17.15 per cent. as compared to 1914. Quite a percentage of this increase came from Pennsylvania. The increased production for the year was nearly 25,000,000 brick. Ohio fell behind a little during 1915 but Indiana, the third state in the rank of the front brick producing states, showed an increase along with Pennsylvania and the increases there were more than enough to offset the decrease in Ohio. So the total production of front brick shows a fairly healthy increase in the face of general decrease or a poor year in the building brick business. This is pretty conclusive proof that the front or face brick idea is gaining ground in the public mind and more of those who build are looking to artistic effects in their walls than formerly. It is a good sign because it indicates a desire for better building which should lead eventually to a more extensive use of brick of all kinds in building operations.

TO THE POTATO.

Twinkle, twinkle, little spud,
As up among the clouds you scud,
You are doubtless feeling gay,
Chasing 'round the milky way;
You have reached to such a height
You are surely out of sight.
Like a diamond now you seem
In your price—and it's no dream;
Twinkle on another twink,
But you'll drive us all to drink
As we chase for needful chink;
You are sailing rather high
As you wink your shriveled eye
Up there somewhere in the sky.
As a flyer you're a bird,
But the price is quite absurd.
Spud so mighty, though so small,
You make diggers of us all;
Never knew how we could love
Till you left and went above;
Never felt how dear you were
Till we paid four dollars per.
Small potato, please come back,
In our lives there's such a lack.
For your presence we so pine
That our stomach hits our spine.
We are tired of eating greens,
Stewed prunes, sauer kraut or beans,
'Tis for you alone we yearn,
Darling tater, please return.

—Exchange.

PYROMETERS FOR CLAY BURNERS.

The above is the title of a booklet issued recently by the Thwing Instrument Company, Philadelphia. As stated in the "foreword" of the leaflet "Thwing pyrometers are manufactured under patents granted to the inventor, Charles Burton Thwing, Pr. D., and assigned by him to the Thwing Instrument Company, being in various types and styles to suit all temperatures and temperature-conditions of commercial practice, as well as serve the individual requirements or desires of the customer. This booklet briefly describes and illustrates both recording and indicating instruments especially adapted for use in clay burning." A copy of this valuable booklet may be secured by writing the Thwing Instrument Company, 3339-41 Lancaster avenue, Philadelphia, Pa. See their ad on page 563.

PROF. ORTON ANSWERS THE NATION'S CALL TO ARMS.

The readers of The Clay-Worker know from previous announcements in our columns that Prof. Edward Orton, Jr., Secretary of the American Ceramic Society, is a strong advocate of universal military training. He took a full course at the Plattsburg camp last summer. When war was declared he at once offered his services to the government and he has been accepted and ordered into active service at San Antonio, Tex., where he will serve to begin with as Major, Quartermasters Department, Officers Reserve Corps, United States Army. Prof. Orton has been a student of military affairs for a number of years and we predict that he will distinguish himself in this new field of effort as he has in all the serious undertakings with which he has been associated.

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FOR SALE

The Indiana Brick Company plant, two miles east of Anderson, Indiana. Located at a junction of three railroads. Favorable freight rates to all markets. Daily output eighty thousand. One hundred and one acres of land. Plant now in operation. Equipped with modern machinery. Operated by electric power. Orders for upwards of three million bricks booked. Business well established and on a paying basis.

This plant is for sale on account of the death of owner and to settle estate. Will be sold at a bargain.

Address THE INDIANA BRICK COMPANY,
53 d Anderson, Indiana.

NOTICE!
TO
BRICK MFRS.
FOR
QUICK BURNS
AND
BETTER COLOR
BURN OIL
AND USE
SCHURS
BURNERS

NO. 1
KNOWN
THE WORLD OVER
SCHURS
OIL BURNER CO.
Los Angeles, Cal.

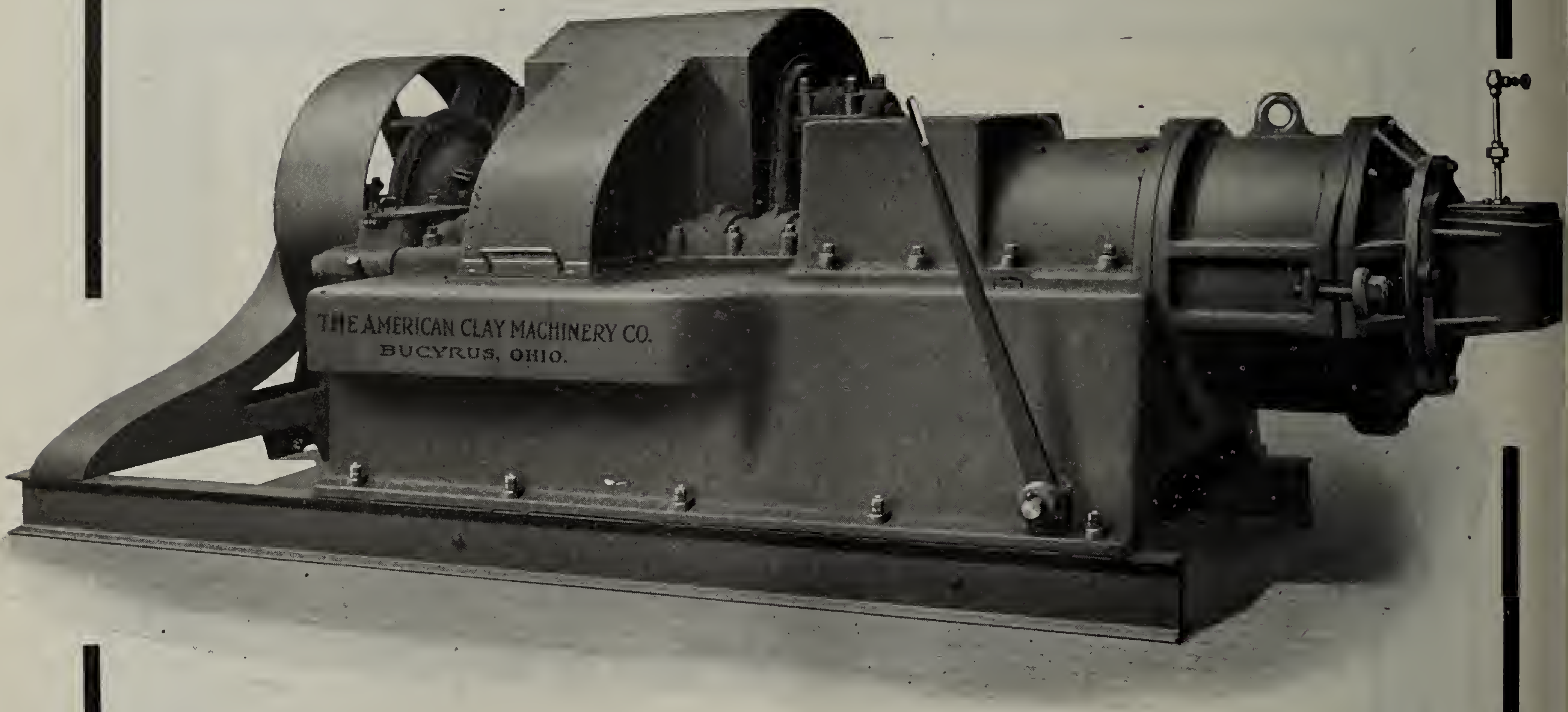
Coal Used?

1250 lbs. or 480 lbs.

Per Thousand BRICKS

In these strenuous days, when every effort is being made to save in every possible way, why should the clayworker use 1250 lbs of coal when 480 lbs will burn the same amount of product and do it better. You save a half of your kiln labor besides and the waste heat for drying. The shortage of cars will make it still more advisable to get along with less coal. Write us about the advantages and savings of the HAIGH KILN. There will be no cost to you. Correspondence invited.

THE AMERICAN CLAY MACHINERY CO.
BUCYRUS, • • • OHIO



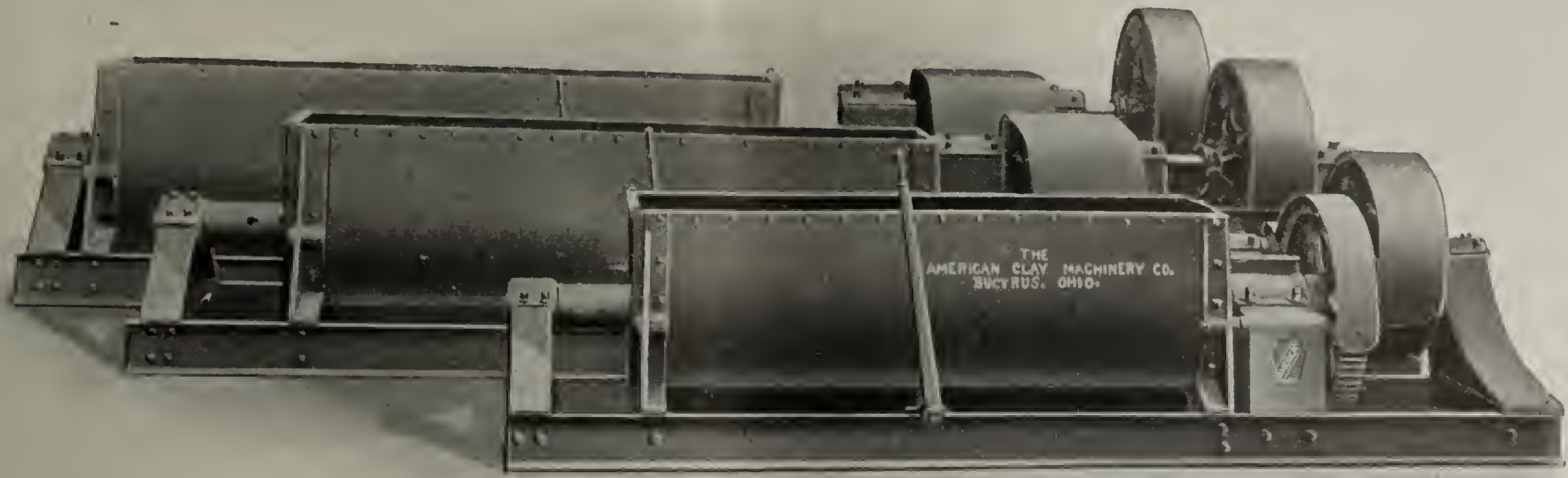
AMERICAN NO. 329 AUGER MACHINE

Here is a big dependable Auger Machine built with a quality in its every part that will tell when it comes to high capacity and long continued production. It has many features characteristic of the American Company's new line of Auger Brick Machinery. These machines have one piece gear frames with oil reservoir in base. They have heavy shafting and gearing. They have a substantial end thrust bearing, gears running in oil, ring oiling shaft bearing, feeder in hopper, a new method of auger construction making them more durable; an improved friction clutch and other features equally as interesting to the man who appreciates modernness in clay machinery.

We have a new circular describing our auger machine line. We will be glad to send you a copy on request.

We build every machine and appliance required for making clay products by all processes. Small and large wants will receive prompt attention.

The American Clay Machinery Co.,
BUCYRUS, OHIO



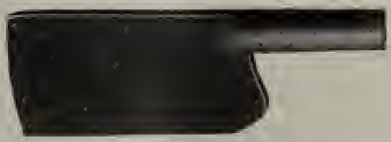
MASTERFUL MILLS

This new AMERICAN LINE of PUG MILLS is the acme of construction securing a large capacity at a small expenditure of power. They are both the pulling and pushing type and can be arranged for discharge at either end desired.

These PUG MILLS are worthy additions to the "Built Right Run Right" line of clayworking machinery and will be found dependable at all times. Our Pug Mill Circular will be sent upon request. IT'S FREE.

Pug Mill Shaft

This shaft shows the construction for all our line of pug mills. It is large in diameter, free from vibrations and reduces danger of crystalization. It is round and polished, insuring greater capacity and easier running.



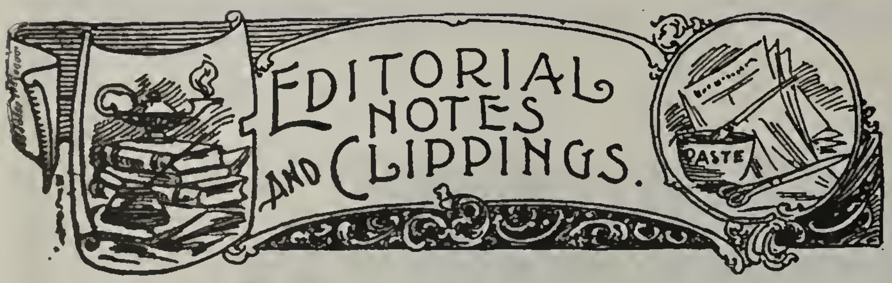
Pug Mill Knife

The knives are adjustable to any extent and the capacity of the mill is variable on that account and the pugging can be regulated as desired. These knives are of the "Battle Ax" type and are keyed in the shaft. They are of a special mixture of iron and can be re-edged.

We build every machine and appliance needed by the Clayworker

The American Clay Machinery Co.

BUCYRUS, OHIO



EDITORIAL NOTES AND CLIPPINGS.

Wilfred G. Gehr is interested in a proposed brick manufacturing plant at Alexandria, Minn.

E. J. Willits will start a brick plant at Bemidji, Minn., which will have an initial capacity of $25,000.

The Michigan Brick Company of Bay City, Mich., has been incorporated with one hundred thousand dollars capital stock.

The Rome Brick Company of Rome, Ga., is in the market for a second-hand nine foot dry pan. Must be in good condition.

A. Skoog of Shreveport, La., writes that he is in the market for a second-hand Chambers Brick machine of about 40,000 daily capacity.

The Oklahoma City Brick & Tile Company, has been organized at Oklahoma City, Okla., by Frank Wells, W. C. Lee and O. R. Rittenhouse.

The Green Press Brick Company of Ferris, Tex., has been organized by W. F. Green, C. E. Pratt and R. R. Green. The company is capitalized at thirty thousand dollars.

William F. Stimmel has sold his brick plant at Kutztown, Pa., to John H. Bieber, who will operate it under the name of the Kutztown Brick Company, with a yearly capacity of two million brick.

W. S. Reynolds, James T. Alton and G. C. Tremaine are the principal stockholders of the Clay Products Company of Detroit, Mich., which was recently incorporated with $100,000 capital stock.

E. K. Phillips, of Willimansett, Mass., has placed an order for a new machine with the Eastern Machinery Company, New Haven, Conn., to be set up in the fall. He just bought a new truck.

The Miner-Edgar Company of Brooklyn, N. Y., which is washing clay at Saylorsburg are kept continually busy in their line. The clay is obtained by a mining process similar to the mining of coal and is mined mostly by contract by miners.

The yards at Berlin, Conn., have nearly all started. The Donnelly Brick Company run all winter. All the yards have installed the Anderson system of carriers, brick from machine to trucks. The C. P. Merwin Brick Company, which is operating but one machine, has in operation a new locomotive.

The estate of John J. Prew has started work at Willimansett, Mass., with all new machinery and with George A. Savoy as manager. This is now one of the most up-to-date yards in that vicinity. They are operating three auto trucks for delivery with good results.

A patriotic demonstration was held at the Crescent plant of the Mack Manufacturing Company at New Cumberland, W. Va., recently at which time a large American flag which had been purchased by the employes of the company was raised above the main factory building. Mayor S. G. Young, an employe of the company, made the principal address.

Dennis J. Landers died at his home at Holyoke, Mass., March 24, age 66. Mr. Landers has been in the brick business for forty years, he retired two years ago on account of poor health. Mr. Landers was one of the most respected citizens in Holyoke, he served as fire commissioner for many years and many other positions of trust. The brick business has been taken over by the Hampshire Brick Company, which will continue the business. He leaves a widow and one daughter.

The Greer-Beatty Clay Company of Magnolia, Ohio, recently increased their capital stock from $6,000 to $60,000.

Thomas Brothers, Turners Falls, Mass., are getting in shape to do some business. They are getting their yard in fine condition.

Harry Mitchell of San Francisco has purchased the brickyard at Hilton, Cal., and will operate same to full capacity—about 50,000 brick per day.

The Higginsville Brick Company has taken over the brick plant at Higginsville, Mo., and will operate same to full capacity the coming season.

Don D. Shallenberger and W. R. DeLay have purchased the Henry Brick & Tile Company at Lancaster, Ohio, and will put same in operation at once. They will also deal in builders' supplies.

Mrs. Dyer, wife of C. C. Dyer, proprietor of the Greenfield Brick Company, Greenfield, Mass., died at her home in Greenfield, April 19, 1917. Besides her husband, she leaves one son and two grandchildren.

The Hampshire Brick Company, Holyoke, Mass., has started two machines. They are going to make several changes next fall, including the installation of a dryer. They have just bought two auto trucks, which are giving good satisfaction.

Mr. M. C. Viele, manager of the North Adams Brick Company, North Adams, Mass., is a very busy man. He has contracts enough to keep the yard running up to its capacity for one year. There is always a good demand for North Adams brick.

Charles B. Gunn of West Philadelphia, Pa., writes that he would like to purchase a second hand sand-lime brick machine or Boyd or Berg hydraulic brick press. Mr. Gunn's address is 5511 Larshwood avenue, West Philadelphia, Pa., and he would prefer that machinery be located near Philadelphia.

The Hill-Karnes Brick Co., Paducah, Ky., which have been closed down all winter started up full force May 1. During the winter months they cleared out the accumulated stock and are starting the year with orders on their books for over a million of their famous blue and red brick. They state prospects are bright for the biggest year's output in the history of the company.

Daniel J. Curtis, a well-known brick manufacturer of Chicopee, Mass., died at his home last month at the advanced age of eighty years. Mr. Curtis suffered a dislocation of his hip last September, which had confined him to his home ever since. He is survived by three daughters and one son, Daniel J. Curtis, Jr., who was associated with his father in the brick business.

The Paxton Brick Company of Paxtonville, Pa., recently purchased the controlling interest in the Watsontown Brick Company of Watsontown, Pa. The company has been reorganized with Edgar Summers of Milton, President and J. C. Fowler of Paxtonville as Treasurer, with the following directors: Edgar Summers, J. C. Fowler, William Fowler, W. H. Hill and Mr. Fisher.

W. R. Chapin of Wyoming, Pa., who built the fire brick plant for the Saylorsburg Clay Company, installed a plant for the Pennsylvania Brick Company, Scranton, Pa., also a grinding plant for the Susquehanna Fire Brick Company, and opened up clay mines for the American Brick and Clay Company, and the Standard Clay Company will in the near future erect a front and fire brick plant for a new company at Wyoming, Pa., to be known as the Blue Ridge Brick Company, having a capacity of 50,000 per day. The company will be capitalized at $250,000. The vein of clay in this section averages 185 feet in thickness and is considered a very high grade product. It is the intention of the new company to install the very last clay working machinery and up-to-date gas fired kilns. The knowledge of an experienced clay manufacturer who has been identified with the clay industry many years, as has Mr. Chapin, should surely mean success for the new company.

Frederick Street, Baltimore, Md. Granite Block Pavement filled with Barrett's Paving Pitch.

Barrett's PAVING PITCH

The Trouble-Proof Filler

Here is a list of common troubles that *can't* happen to a pavement if you use Barrett's Paving Pitch:

It *can't* crack.

It *can't* bulge from expansion.

It *can't* thrust curbing out of line or manholes out of place.

It *can't* "explode" on a hot day.

It *can't* get damaged by frost in the foundation.

It *can't* get noisy by the development of resounding air-spaces.

It *can't* impede underground pipe repairs.

It *can't* admit water to the foundation.

It *can't* get slippery—the grooves are always on duty.

It *can't* be damaged by immediate admission to traffic.

With Pitch filler it is easier to get a good block-paving job than with any other filler. It isn't fool-proof, but its inherent qualities make it possible to get good work with a minimum of trouble. The Standard Pitch is Barrett's Paving Pitch. Look for the label on the barrels.

Booklets free on request. Address our nearest office.

The Barrett Company

TRADE B MARK

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
The Paterson Mfg. Co., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B.
Halifax, N. S. Sydney, N. S.

EDITORIAL NOTES AND CLIPPINGS—Continued.

The Cadillac Clay Company of Detroit, Mich., has been incorporated by Eugene Evans, T. J. Evans, Sr., and Nicholas J. Engel.

All of the employes of the Kankakee Tile & Brick Company, Kankakee, Ill., received an increase of 25 cents per day beginning May 1.

The Rose Hill Brick & Tile Company of Harlan, Ky., has been incorporated with $10,000 capital stock, by J. A. Creech, W. B. Landrum and V. G. Schimmel.

The Builders' Brick Company of Butte, Mont., has recently been incorporated with $10,000 capital stock. Those interested are Peter Stamos, B. Stamos, J. O. and C. Peterson.

The Elgin Standard Brick Company, Elgin, which has increased its capital stock from $30,000 to $75,000, will spend about $45,000 in installing additional machinery and equipment.

The brick plant at Missoula, Mont., which has been idle for a year or more, is being overhauled and operations will be started in the near future as the Missoula Clay Products Company.

The Crescent Fire Brick Company of Wilmington, Dela., has been incorporated with $125,000. William F. O'Keefe, George G. Steigler and E. E. Wright, all of Wilmington, are interested.

The Walsh Fire Clay Products Company of St. Louis, Mo., will build an industrial village at Vandalia, Mo., where their large plant is located. The plans now under way call for an expenditure of $500,000.

The Southern Tile Company of Mobile, Ala., has been organized with the following officers: W. G. Smith, President, Mobile; George Durocs, Vice President and Treasurer, New Orleans; J. W. Emrich, Secretary, Mobile.

The Richmond (Cal.) Pressed Brick Works are being enlarged at a cost of $150,000 by the owner, the Los Angeles Pressed Brick Company. More kilns and a number of buildings will be added. One new stack will contain 75,000 brick.

The Silliconite Refractories Company has been organized with $30,000 capital by Robert R. Zell, Birmingham; J. H. Water, Anniston, Ala., and J. E. Cosgrove, of Atlanta. A plant will be built at Irondale, Ala., with a capacity of 20,000 fire brick per day.

Application has been made for the incorporation of the Cannelton Clay and Coal Company. The incorporators are Harry R. Beegle, Frank H. Bonnett, Albert Welsh, C. Raymond Shannon, John G. Little, John C. Ault. Business is to be transacted at New Galilee, Pa.

James J. Booth, formerly a partner of Senator William Flinn in the brick and contracting business under the firm name of Booth & Flinn, Pittsburg, died recently following a short illness due to pneumonia. He was eight-one years of age and had lived in Pittsburg since 1854.

The Columbia Mineral Products Company of Columbia, S. C., was chartered recently for the purpose of mining clay and manufacturing clay products. The officers of the company are: President, F. L. Whittemore; Vice President, Frank W. Atwood; Treasurer, William J. Keenan, and Secretary, W. J. Keenan, Jr.

The Sparata Tile & Brick Company has been organized at Sparta, Mich., with a capital stock of $40,000. The concern will take over the property formerly owned by the Sparta Clay Works, and as soon as new equipment is installed will begin operations. The officers chosen are: President, F. D. Pease; Vice President, Enoch Armock; Secretary, F. A. Wheeler; Treasurer, C. A. Johnson, all of Sparta. Directors: T. E. Graham and Philip Fritz, Grand Rapids, and William Rasch, Pearley Ebers, N. A. Shaw and Fred Klenk, Sparta.

Charter amendments were filed by the Athens Fire Brick Company, Athens, Texas, decreasing capital stock from $50,000 to $25,000.

Leonard J. and Charles Scholl, proprietors of the brickyard at Clio, Mich., will materially increase the output of the plant this season.

Joseph Petty, sixty-one years old, was killed recently when he was caught in a cave-in at the plant of the National Drain Tile Company, Hillsdale, Ind.

A brick plant with a capital stock of $25,000 has been organized at Bristow, Okla., and will begin building at once. Sam Allen of Sapulpa will be at the head of the concern.

The Great Falls Brick & Tile Company of Great Falls, Mont., has been incorporated by S. S. Hobson, Frank W. Mitchell and R. Cooper. The company is capitalized at $200,000.

James J. Netterville, has been appointed receiver of the Indiana Brick Company of Anderson, Ind., and will operate same to full capacity. The appointment followed the death of the owners F. W. Makepeace last month.

The Jackson Fire Brick Company, Jackson, Tenn., announces that it has purchased the Hunt Pressed Brick Company, successor to the Southern Tile & Brick Works at Jackson. The property bought includes a firebrick plant and the Jaxon brands of firebrick.

A petition for a dissolution and disincorporation of the Bergman Clay Manufacturing Company of Spokane, Wash., has been filed by J. H. Evans, President of the company, who states that he is acting in accord with the expressed desire of the majority of the stockholders.

F. E. Swift, for many years a well known kiln builder, located at Ottawa, Ill., died May 3, at Dayton, Ohio, where he had been in business for a number of years. Mr. Swift was the inventor of the Swift kiln furnace. He was sixty years of age and leaves a wife and nine children, all of whom are grown.

P. J. Kennedy & Company, contractors have completed negotiations with the Holyoke Brick Company, of this city for the purchase of their large brickyard at Willmansett, Mass. This property which has been under the management of John J. O'Neill proprietor of the Holyoke Brick Company for several years is considered one of the best brickyards in that section. The price involved is said to be $40,000.

The Mayfield Clay Company has filed articles of incorporation, with a capital stock of $100,000 and a limited indebtedness of $25,000. The incorporators are W. M. Reed, H. C. Overby, D. H. Hughes, R. B. Phillips, R. R. Winston and W. J. Watkins. The company will operate extensive clay mines in Graves County, Ky., and have headquarters at Paducah, Ky. The clay is of fine quality and will be used in manufacturing chinaware and tile.

Plans and specifications have been accepted for the plant which the American Refractories Company of Joliet, Ill., of which Emil Winter of Pittsburgh is president, has decided to build at Baltimore. This plant will represent a $300,000 investment, and its daily capacity will be 30,000 magnesite and chrome bricks. A twenty-acre site will be occupied and the plant will include eight kilns, each 32 feet in diameter by 16 feet high. The buildings will be of fireproof and daylight construction, mainly steel and brick. They will include stock shed, storehouse, shops, office, kilns, boiler-house and main factory, on concrete foundations, equipped with the electric power drive. The office structure will be of brick, 55 feet long by 25 feet wide, and the other structures will range from one to four stories high.

While you are pondering and debating with yourself as to whether you should do it or not, the other fellow is installing the

Underwood Producer Gas Burning System

(PATENTED)

and has paved the way for getting the fullest measure of efficiency in the operation of the truly important feature of his business. Why don't you assume this progressive spirit and at least investigate what this system will do for you? It doesn't cost you anything to be convinced, but your burning is costing you excessively all the while you remain in the ranks of the unprogressive. Don't stand in your own light.

IF it is worth anything at all to you, as it surely must be—

To get the greatest efficiency from the coal used in your Dryer
To save all of the time handling coal and the waste incident thereto
To do away forever with grate bars, bearing bars, etc.
To save labor in the operation of your Dryer,

then convert it today into a

Producer Gas Fired Dryer

This conversion, which can be done to any direct heat type of Dryer, involves only an insignificant investment when done in our efficient way and will give you maximum returns.

The Manufacturers Equipment Co.
Dayton, Ohio, U. S. A.

Geo. H. Smith, Western Agent, 507 Reliance Bldg., Kansas City, Mo.

If Its a Question
of KILNS
We Can Answer It

GRATE BARS,
BANDS, LUGS,
VENTILATORS,
CASTINGS

Equally efficient in round, square or rectangular kilns, single or multiple stack type. New Hook Kilns cost less, as a rule, than kilns of other styles. Old kilns can be changed to our type at comparatively small expense. Give us number and size of your kilns, kind of ware, burning time and fuel consumption. We will estimate cost of installation and saving that can be effected.

HOOK PATENT KILN CO.
High and Spring Streets
COLUMBUS, OHIO

PLANT MANAGEMENT

(Continued from Page 607.)

To prove the stability of the suggested structure itself, let be:

R=section modulus.

BM=bending moment.

Fibre stress of concrete=700 pounds per square inch.

Shear of concrete=30 pounds per square inch.

Resistance against shear at point Y:

30x3x12=1088 pounds.

Resistance against bending at point Y:

$$R=\frac{bxd2}{6}=\frac{12x9}{6}=18.$$

$$\frac{18x700}{12}=1050.$$

$$BM=\frac{293x2.5x2.5}{2}=915 \text{ foot-pounds, thus satisfactory.}$$

The concrete slab to be reinforced by ⅜-inch diameter round steel bars, spaced 4-inch centers.

Foundation on Piles.

If the condition of the ground does not warrant a sufficient load-carrying capacity to suit the foundation prescribed, there still remains another way to solve the problem. A suitable foundation for the same motor is shown in Fig. 3. With this method a certain number of piles is driven into the ground to a depth where they reach a soil strong enough to withstand the stress. The masonry or concrete work is then constructed upon the projecting headers of the piles, thus resting entirely on the latter. The succeeding calculation is to show the merits of such a structure, it being absolutely safe, and will accomplish its purpose:

M3=M=4518 foot-pounds.

M3=W+(5, 17x2+5x1, 17)x135=12186

plus weight of filled-in-ground= 1330

total=13516

$$e3=\frac{4518}{13516}=.33 \text{ foot.}$$

k3=(D4—2a)x.118=.77 foot.

A3=D4×D5=7×5, 17=36, 19 square feet,

$$O^{\circ}_{3}=\frac{13516}{36.19}=373 \text{ lbs.,}$$

$$O''3=373\times(1+\frac{.33}{.77})=533 \text{ lbs.}$$

Consequently load to be carried on each pile:

$$\frac{36.19\times533}{4\times3}=1610 \text{ lbs.}$$

The piles selected in this instance are of an average diameter of 5″. To find out at which greatest depth they should reach good soil to furnish the desired safety, let be:

l=allowable free length of pile,

E=modulus of elasticity per square inch,

d=diameter of pile in inches,

P=load carried by each pile in lbs.

$$e^2=\frac{.049\times d^4\times3.14^2\times E}{P}=$$

$$e=\sqrt{\frac{.049\times625\times10\times400000}{1610}}=276 \text{ inches,}$$

$$\text{or } \frac{276}{12}=23'—0''.$$

The completion of this reckoning requires yet to ascertain, just what ramming is necessary on each pile to obtain the resistance wanted for safely withstanding the load to be rested on it. For this purpose we apprehend the mechanical power developed by the rammer, which is readily figured from the weight and stroke of its hammer. This power can be observed to cause a certain downward move of the pile at each hit. Said move being largest at the first hit and gradually decreasing the deeper the pile is driven, indicates the exact amount of resistance offered by the ground. Consequently can be determined therefrom, what length the downward move resulting from the last hit must not exceed, to guarantee ample safety against sinking of the pile after the load is placed on it. To this end shall be:

f=move of pile at last hit, in inches,
Q=weight of hand-ram-hammer in lbs.,
p=weight of pile in lbs.,
h=drop of hammer in inches,
m=degree of safety.

$$f=\frac{h\times Q^2\times q}{m\times P\times (Q+p)^2}=\frac{54\times 250^2\times 60}{3\times 1610\times 96100}=.44=7/16\text{ inch.}$$

The utter appearance of Figs. 2 and 3 may invite a timely argument. Probably not for their unusually nice looks will they arouse suspicion, but for the fact that they indicate the use of concrete in their make-up, instead of brick. While it may be true that brickmakers should not boost competitive material by using it in their own construction work, it cannot be denied that concrete is a very suitable material for the construction of foundations, and on account of its cheapness has found adoption for this class of work almost universally. It shall be duly mentioned, however, that the same foundations constructed of hard-burned brick would answer the purpose just as satisfactorily.

To compare the cost of brickwork to that of concrete it is justified to figure the latter at $4.50 to $5.00 per cubic yard including the labor employed for mixing and tamping, etc. The price specified would sustain a mixture of two parts of Portland cement, five parts of sand and nine parts of gravel. The cost of brickwork exceeds this by a large margin as can be seen from the following estimate:

500 hard-burned brick at $8.00 p. M.	$4.00
¼ yard lime-cement mortar	1.10
Wages for bricklayer and helper	4.50
Total cost per cubic yard	$9.60

(To Be Continued.)

J. C. STEELE & SONS TO BE REPRESENTED IN THE NORTH BY THE MANUFACTURERS' EQUIPMENT CO.

The brick and tile manufacturers of the central states will be interested in the announcement that the complete line of brick and tile machinery made by the J. C. Steele & Sons Company, Statesville, N. C., will in the future be supplied to the trade in the northern states by the Manufacturers' Equipment Co., Dayton, Ohio. The Steele line of clayworking machinery includes a variety of clay crushers and mixers, brick and tile cutters, stiff clay brick and tile machinery, brick trucks, cars and all manner of yard supplies of a character to meet the needs of manufacturers, whether their output be large or small. Those of our readers who may be in the market for high-grade moderate cost equipment are requested to tell the Manufacturers' Equipment Company of their needs. Catalogues and quotations will be supplied promptly. See ads on pages 641 and 663.

GANDY Belts

Utilizing the greatest per cent of available power is a constant problem in factory operation. That's why belting—the power transmission agent—receives so much thought in an analysis of factory overhead.

Buy belting *carefully.* Be sure it will resist water, steam, dirt and grease, that it won't stretch and slip—just when you're on a rush job.

You will be safe if you order GANDY BELTING. For nearly 40 years it has retained its prestige, because it is made right. It will continue pliable, will retain its grip with the minimum stretch or slip in the face of unusual exposure.

Quality is built into Gandy Belting. Give yourself the opportunity to prove this.

The GANDY BELTING CO.
749 West Pratt Street, Baltimore, Maryland
New York Branch, 36 Warren St.

SUBMITTING SAMPLES.

THERE was a story told in the Retail Department of one of the lumber papers recently that incidently touched upon the submitting of samples of brick which contains a moral for brick manufacturers upon this subject.

The story was told by a retail lumberman who had taken a contract to furnish material for a government job. He had an impression that the government would be very particular so when he went to a brickman to get samples and prices before figuring on the job he told the brickman that it was a government job and asked for samples.

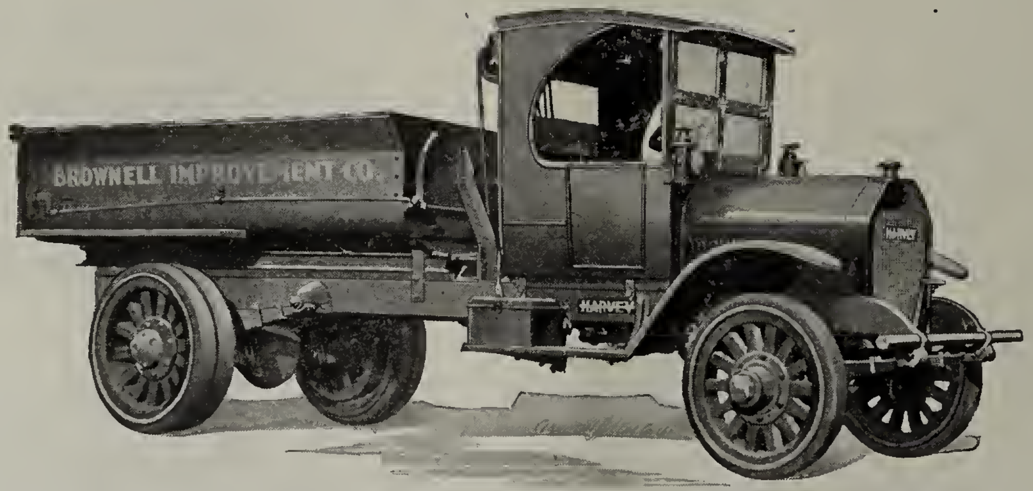
"Right here," he said, "is where the brickman stumped his toe and stumped it good and hard. We told him the brick was for the government and I reckon that excited him. He dashed out in to the brickyard and picked out two of his nicest, hardest, reddest, smoothest common building brick and mailed them to Bill Taft and the boys at Washington and they gave us the brick order. There were about half a million brick in the order and we told the brickman to start the ball. We closed our brick contract subject to the inspection of the government superintendent.

"The first car of brick to arrive showed up all right but the next three cars were turned down. We went up to the job to find out what the trouble was and were told by the superintendent that they were too light in color. They were good brick. Nice, smooth, hard-burned brick, and good enough for any job in the world. We asked the superintendent what difference the color made when the brick were to be used for backing up. He said there was no use arguing about what kind of brick they were to get, as he had one of the samples we bid on and to back up his statement he produced one of the two bricks the brickman had mailed to Taft and the boys. We asked him if he was going to demand that all the brick matched in color, and he said, 'Why, certainly.' You didn't have to look far to see that brickman's finish. He had sent in two of his best brick he could find and then had contracted to furnish five hundred thousand just as good and the same color. When a car was turned down we notified the shipper and he would instruct us to unload the brick, and do the best we could with them. The consequence was we had brick scattered all over town by the time the job was finished."

The same lumberman had lots of the same kind of trouble with his lumber bill and the story was told to illustrate some of the difficulties of doing business with government jobs, but it serves equally well to illustrate the stumbling blocks in connection with submitted samples. When a man submits samples they should be as nearly representative of his average product as possible. It is true that when a man is called upon to submit samples he is figuratively between the devil and the deep sea because if he sends a lot of poor stock for samples he is not likely to get an order, whereas if his sample selections are from the best stock he can find he is likely to have difficulty living up to them. It is really a difficult thing to give an idea of brickman's product from just a few samples because it is not practical to represent the product of a kiln with a few brick. The best proposition, where it can be worked out, is to have a showing of quantity, of a wagon load or a car load, or if the customer is near enough, have him come and see the entire product of the kiln. This is not always practical, however, and it does become necessary many times to submit a few samples to give an idea of one's product. Where this is done the samples should be selected with care, that is care to get something fairly representative and not with a view of making the best showing possible, because the making of too good a showing in samples sometimes paves the way to future trouble.

HEAVY SERVICE
HARVEY TRUCKS
The Repeat Order Truck

ALL
UNITS
OVER
SIZE



SIZES
2½ Ton
3½ Ton
5 Ton

Harvey Trucks and Tractors have made a general record of economical efficiency under the most trying conditions. *Write for Information.*

Chicago
Service Station
3812-20 Normal Ave.

HARVEY MOTOR TRUCK COMPANY
HARVEY, ILL., (Chicago Suburb)

Sales Office
30 N. LaSalle St.
CHICAGO.

Mention The Clay-Worker.

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ORIGINAL BOSS SYSTEM **Drying and Burning** ORIGINAL BOSS SYSTEM

BOSS TEN-HOUR DRYER

Use either waste heat or exhaust steam.
No live steam. No direct firing.

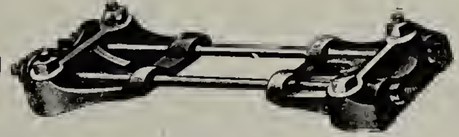
BOSS SYSTEM OF BURNING BRICK

Applies to all types of kilns and will save HALF in your cost of burning.

Let us save Time and Money for you

ORIGINAL BOSS SYSTEM **JOHN C. BOSS CO.** ORIGINAL BOSS SYSTEM

Monger Bldg., Elkhart, Indiana



Kiln Band Lugs That Won't Give 'Way

Caldwell Kiln Band Lugs will never slip or give 'way because **they can't.** They do not depend on fricton to hold them. They are built on scientific principles.

Our catalogue on Tanks and Hoop Lugs will tell you all about them. We will gladly send it on request.

Prompt Shipments.

W. E. CALDWELL & CO., Inc.,
1970 Brook St., Louisville, Ky.

Caldwell TANKS AND TOWERS

1917 Announcement

We can save you 25% of your fuel bill. No money until we do it. Don't you think this worth a stamp?

Then write to the

X. L. KILN & DRYER CO.
Box 269, Ottawa, Ill.

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

GETTING ADVERTISING RESULTS

WHEN A MAN INVESTS money in advertising, whether it be as an individual or firm or a group representing an industry, it is naturally and properly expected that some good returns will come from that advertising, whether it is run in a newspaper, trade paper or other periodical, or some other form of publicity.

One of the errors of recent years of the advertising men who have sought to keep a check on results from various channels of advertising to make comparison has been that of confusing direct replies with actual results.

Edwin A. Walton, advertising manager of Burroughs Adding Machine Company, who represents and manipulates one of the big guns of the advertising world, some time since pointed this error very forcibly and gave some good advice on the subject in a talk before a gathering of advertising experts.

He told of their experiments in watching for replies in which he said that from an advertisement in the Saturday Evening Post with a circulation of more than two million copies they received only seventeen replies. Looking at these and concluding to try a little further for direct replies they offered in their advertising in the same publication an attractive looking book which could be had for the asking. The result was 265 replies, a fraction more than one reply to each 10,000 of circulation.

From this they concluded that replies were either a poor indication of results or they were getting mighty slim returns for their advertising. Then they tried what they considered a thoroughly educational advertising in the same medium and the result was one lone reply from a periodical carrying a circulation of two million and claiming more than five million readers.

After that, he said, they quit trying to get replies, stopped keying their advertisements and went to working for results instead of watching for replies. They don't care a thing about replies any more. What they are working for is results and they realize that they are getting results and they measure the comparative value of media by their own judgment, enlightened as much as practical by the nature of the medium and the field to which it goes. They make some study of territory and of clientele in a given territory and so on, but they have absolutely quit trying to keep a check on their advertising results through direct replies.

Nothing could much more graphically illustrate the common error of many advertisers who key their advertisements and watch for replies coming from different sources instead of planning for results from a properly conducted campaign of advertising.

Advertising should be conducted intelligently and directed for results, which means making a broad and comprehensive survey of the field it is desired to cultivate and the manner available for this cultivation, and with this broad survey or rather behind it must be brains. When brains are used and used intelligently the general conclusion reached is that one of the best fields for advertising anything having to do with industry in any way is the trade paper.

James H. Collins, who has written quite a lot of spicy stuff on salesmanship and industrial development, paid a compliment to the trade paper that is worthy of consideration in connection with the subject of advertising with the following paragraph under the general subject of "Literature on the Job."

"The cornerstone of every business man's reading is his trade press, of course. There he finds news of his job, the latest things in methods, movements and men, information too recent to have been embodied in books."

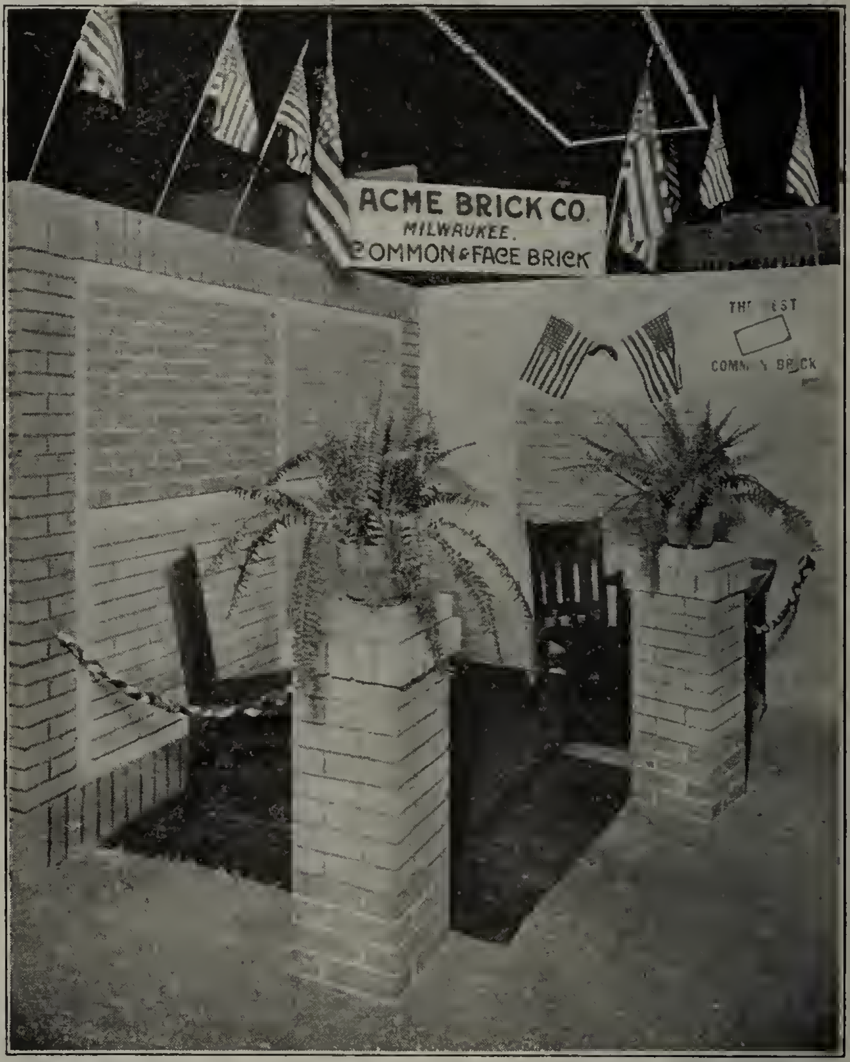
Which certainly should mean that in the trade paper is a good place to advertise.

DEATH OF RABBI J. LEONARD LEVI.

The good people of Pittsburgh were shocked recently by the sudden death of Rabbi J. Leonard Levi. His death was caused by pneumonia. Dr. Levi was one of the most eminent Jewish leaders and was known internationally as a lecturer, philanthropist and philosopher. His address at the N. B. M. A. banquet at our last Pittsburg convention was one of the finest after dinner speeches that has been delivered before the Association. His untimely death is an irreparable loss to his race and to American citizenship.

AN EFFECTIVE, THOUGH MODEST, DISPLAY OF BUILDING BRICK.

We are indebted to the Acme Brick Company of Milwaukee, for the accompanying view of an exhibit recently made by them at the Home and Real Estate Show in that city. As the reader may see, the display, though modest, was attractive. The hordes of home builders who visited the show were impressed with the beauty and stability of brick, no doubt, and consequently will be more apt to consider the building of brick homes in the future than they have been in the past. It is to be hoped this is true for Milwaukee is a wooden city. The brick display illustration was built of sand lime brick of which the Acme Company makes a variety of colors, including brown, red, buff, pearl grey and the common white brick.



The Acme Brick Company's Exhibit at the Milwaukee Home Show.

REFORMATORY INMATES BUILD CONNECTICUT ROADS.

Road building with convict labor is an old story in some states but Connecticut has tried a new kind of compulsory labor on her highways. There are many husky youths sent to the State Reformatory whose previous surroundings failed to teach them the necessity of steady work and the personal satisfaction derived from performing useful tasks creditably. They have recently been used in building about three miles of improved roads, in crushing stone and in building macadam roads. Charles J. Bennett, state highway commissioner, reports that the work done by these youths is "excellent and economical," and that in every case they behaved themselves fully as well as ordinary laborers do.

THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

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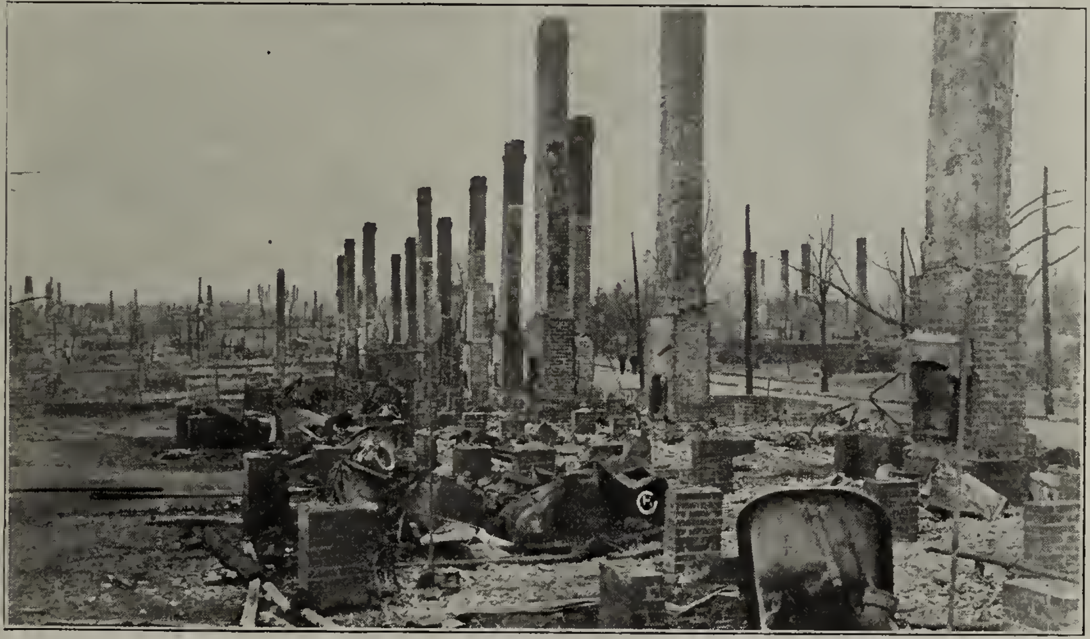
ATLANTA ANOTHER HORRIBLE EXAMPLE

Fierce Fire Loss in the Residential District of Georgia's Metropolis Destroying Fifteen Hundred Homes.

THIS GREAT COUNTRY of ours has shouldered many unusual burdens the past year, including several disastrous fires, and all these bring with them certain lessons which if heeded may prove in a small measure compensation for the loss and hardships which followed in their train. Perhaps no where was there a more impressible lesson than that furnished by the great conflagration at Atlanta May 21, 1917, which swept over seventy-three city blocks, destroying over fifteen hundred homes, causing a loss directly due to fire of approximately five million dollars.



The Forest of Chimneys Testify to the Unburnable Quality of Building Brick

In sending us some photographs of the burned district, Mr. Mifflin Hood, President of the B. Mifflin Brick Company of Atlanta, writes:

"There were no brick buildings destroyed except a few that were roofed with wood shingles and surrounded by frame buildings. The fire destroyed nearly every building over a territory of nearly two miles in length and five blocks wide.

"After the fire once got headway it was almost impossible to check it, due to the continuance of frame construction with shingle roofs. There was a wind blowing that carried flying embers, visible from the roof of one of our tallest office buildings, that caused new fires to break out from two, four to seven blocks in advance of the place of origin. One business street was in the path of the fire, and on this street were brick business buildings, all of which escaped, and three blocks further north were some brick buildings and the fire traveled in the shape of a horseshoe, leaving the brick buildings uninjured. There were three brick school buildings in the path of the fire, all of which escaped.

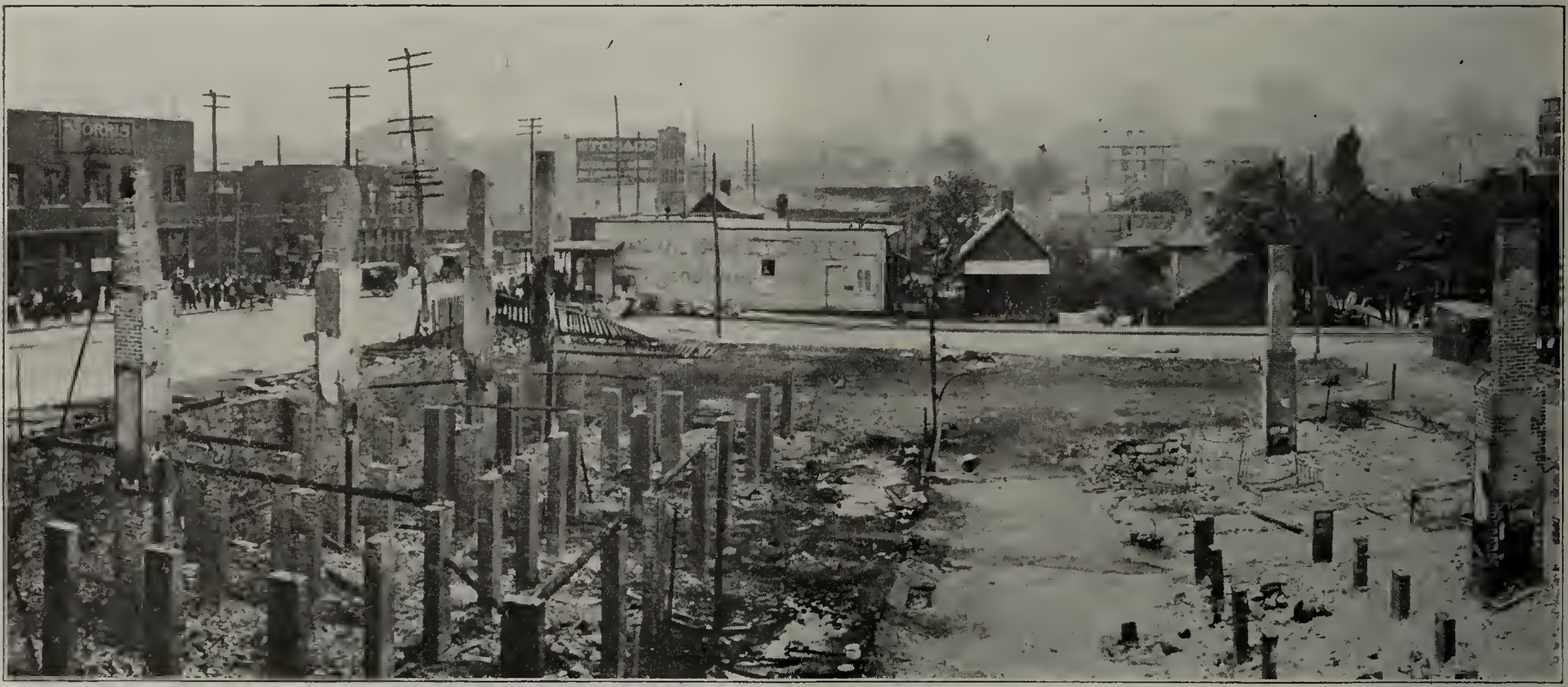
"All rumors of firebugs were exploded, except the suspicious circumstances of two vacant houses catching on fire in different sections of the city the previous evening, and the following morning the worst fire of the year broke out in the residential section of West End, and simultaneously in the Candler warehouse followed shortly by destroying an entire city block on the South Side, which fires were requiring the attention of the entire city fire department, when the fire broke out at Decatur and Fort street, which, in a few minutes, developed into a conflagration, entirely beyond the control of the fire department.

"Had it not been for the thousands of soldiers who were garrisoned at Fort McPherson on the suburbs of Atlanta, and the quick response of the fire departments of nearby cities, and the liberal use of dynamite, the fire could not have been gotten under control without destroying most of the city outside of the fire limit, in which fireproof construction is rigidly adhered to.

"The brick manufacturers and those who manufacture fireproof material in our section are alive to the situation and doing all in their power to get fireproof and fire resisting material, especially burnt clay lines, used in the rebuilding of our city, which we expect to be more beautiful and more permanent than ever before.

"We have heard of no complaining people as every one seems to be co-operating and all of the homeless are being taken care of without outside assistance being required."

We have had the facts and figures of our annual fire losses laid before us time and time again. Through organized effort they have been presented to the public in various forms, and in some instances they have had a good effect. The effect, however, was nothing like as impressive as lessons from experience which cost immense sums and great suffering to humanity, things which might be guarded against if the public would but heed warnings given and follow the logical advise in the matter of building to prevent just such conflagrations.



A Portion of Atlanta's Burned District, Showing the Complete Devastation Wrought by the Fire. Everything Burnable Be

Just why the public listens, ponders for a minute and then goes on its way carelessly is a matter difficult to answer specifically. Perhaps it is partly because we are accustomed to the roll of big figures from the tongues of orators, and their appearance in the papers, so the staggering figures of annual fire losses do not for this reason impress us as they should. The public is too much given to listening, shrugging its shoulders, then going on its way until the matter is brought home forcibly with some happening of which the conflagration at Atlanta is a striking and deplorable example.

That is not the worst of it either. When those in charge of building regulations in towns and cities are reasoned with and have finally become impressed with the logic supporting the necessity for safeguarding humanity by building restrictions against wood and other combustible material, then they no sooner get in action along these logical lines than a great howl of protest is heard from the lumber interest, who wield a big influence throughout the country, and are actuated mainly by their own selfish desires to promote further business in lumber. The saw mill men, who builds a fireproof mill of steel and concrete and safeguards his lumber drying with brick and hollow tile kilns, will lend not only his countenance, but contribute a fair share of his money to a propaganda advocating the use of wood to build homes even to the extent of insisting upon it being permitted in congested city districts where it endangers the life as well as the property of the citizens.

That was one trouble with Atlanta. Atlanta was largely a wooden city outside of the central or restricted fire district and presumably now Atlanta has had her lesson and not only are the clay products people in that section of the country awake to the occasion and doing their share to promote the idea of building permanently and safely with brick, but the local papers also seems to have the lesson impressed upon them, as will be seen from the following editorial brief from one of the Atlanta dailies:

"The great fire in Atlanta is an argument against wooden houses in cities. In France the Germans have to knock down the houses with cannons because they are all of stone or brick. Europe had to abandon wood as a building material long years ago because lumber could not be had. The houses have been of stone for about 500 years, and many are that old.

"America—our part of it—is the only country now building wooden houses. It is still done in parts of

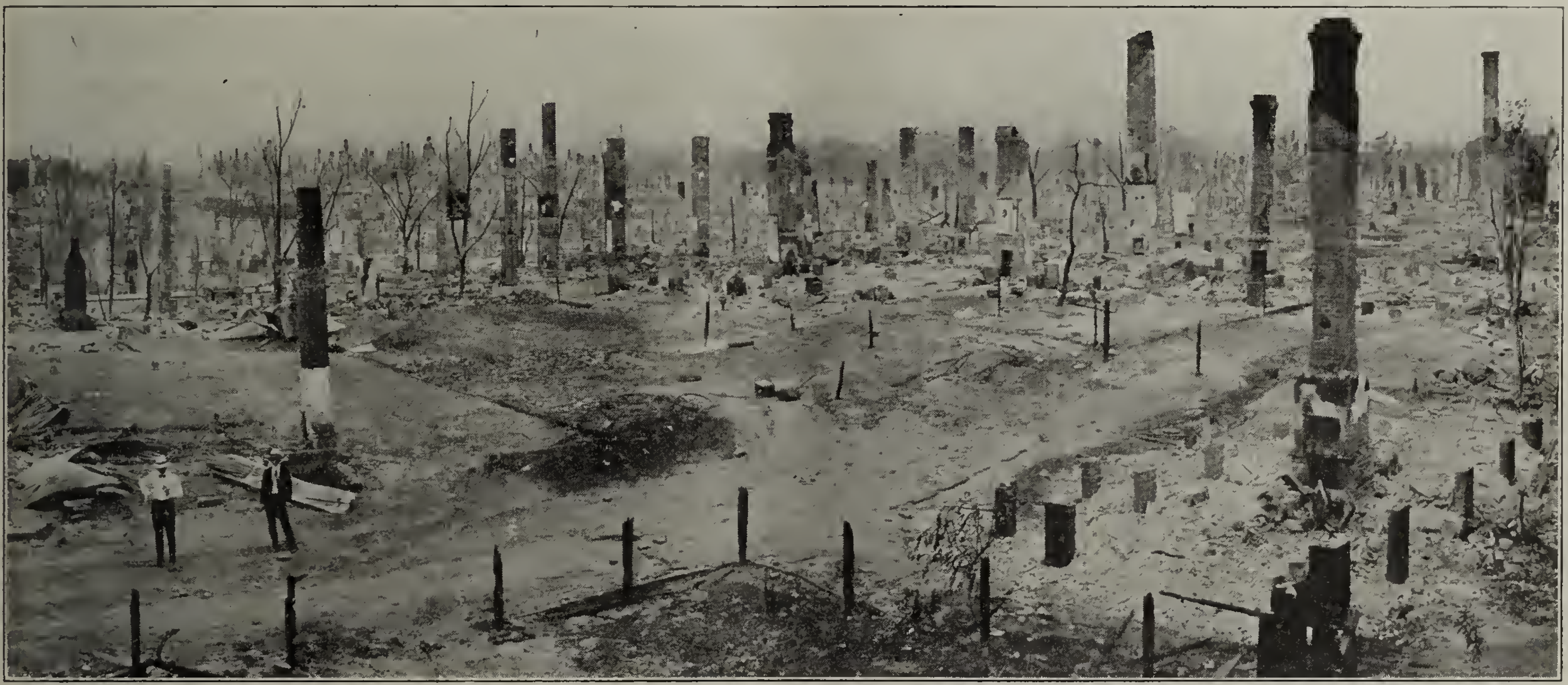
Africa and in parts of South America, but stone, brick adobe and later cement are the building materials. Stone and brick are costly, but their years of endurance tend to make them cheap ultimately."

The pictorial story of what the fire did to Atlanta should be of itself sufficiently impressive of the needs to build with brick, not only in Atlanta, but in every city and town throughout the country. The forest of standing chimneys are mute but impressive evidence in support of the fact that brick will not burn, and that it is practically the only thing which will stand up against the ravages of fire consuming everything else around it.

The lesson from Atlanta is not only one that should impress the necessity for building with brick, but it is one which should also stimulate more activity along the line of promoting the use of burned clay roofing tile, a line of effort which The Clay-Worker has been urging repeatedly and persistently for several years.

Brick and hollow tile, of course, constitute the big material item in home building, and they are the first essentials to proper home construction. The clay-working industry itself has already been informed on this point and properly impressed with the qualities of brick and tile as compared to other building material. The task before them is that of so impressing the general public from lessons of this kind that the public will stand firmly for what is right regardless of the selfish pleas of those offering cheaper, flimsier and combustible building material.

Then, while about it, and while the brick and building tile are the big items, the roof of the building is also a matter of importance. Note for example, that repeated reference made to the matter of the shingle roof in the case of the Atlanta fire. This is a thing that happens wherever there is a bad conflagration. The shingle roof not only burns itself, but the wind carries coals and sparks from the burning shingle roof and it is this which constitutes one of the most dangerous elements in congested districts when fire once gets started. Notwithstanding this fact, which is testified to every time there is a fire in a town or city, it is the shingle people who put up about the greatest howl of any against insistence upon safety regulations against fire in the building codes. The howling of the shingle people in controversies of this kind is nothing but a cry for self. There is no interest to be served or which they are trying to serve but that of their own industry—to promote a larger trade by encouraging a general use of shingles. They encourage this and insist upon it being allowed in the face of the easily proven fact that it endangers humanity as well as property. It is the danger from the shingle roof that makes one of the urgent needs for more promotion of burned clay roofing tile. The best authorities all agree that there is nothing superior to burned clay tile for roofing. It is rated highest of all, both in the lists of insurance people and in the opinions of architects.



ing Destroyed, the Brick Chimneys and Piers Alone Remaining, Mute Witnesses of the Folly of Building Frame Houses.

So in taking home the lesson from Atlanta and using it to impress upon the public at large the fact that the way of safety as well as the way of permanence and architectural beauty is in brick building, let us not overlook the important fact that to finish off the job right the brick and tile houses should be covered with burned clay roofing tile.

That moving pictures can be used effectively to advertise machinery is pretty well known to those who have attended the conventions the past few years back. The question this brings up is, to what extent can they be used to advantage in exploiting brick itself?

Peaceful relations make the greatest bulwark of protection, and the unfortified line between the United States and Canada is a shining example to the world in properly protected boundaries.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

BURNING CLAY WARES.

PART XIII.

Kiln Temperatures.

IN THE PRECEDING problem we had 12192 B. t. u. per pound of coal after eliminating the carbon in the ash.

In determining kiln temperatures we will assume 50 per cent. excess air which represents fairly good yard practice. We will also assume 20 per cent. radiation loss which would apply to the maximum fuel firing state.

Under perfect combustion we had 4138 B. t. u. stack losses and to this we must add the heat taken out by the excess air.

The air requirement was 9.1086 pounds and half of this will be 4.5544 pounds, which at 1432 degrees has a thermal capacity of 1598.5 B. t. u. This added to 4138 gives a total of 5736.5 B. t. u. The radiation loss (12192 × .20 is 2438.4 B. t. u., making a grand total of 8174 B. t. u. for the stack losses and radiation.

We have available for burning the ware 12192 — 8174.9 = 4017.1 B. t. u. per pound of coal.

The problem of kiln temperatures can best be solved by not considering the stack losses. We have then 12192 — 2438.4 = 9753.6 B. t. u. available for kiln temperature, and we can determine the kiln temperature by a series of approximations.

Let us assume a kiln temperature of 2432 degrees.

The heat required to maintain the gases at this temperature will be as follows:

$$\begin{array}{rcrcr} .6489 & \times & 1584 & = & 1027.9 \text{ B. t. u.} \\ 2.4413 & \times & 802 & = & 1957.9 \text{ B. t. u.} \\ .0594 & \times & 623 & = & 37.0 \text{ B. t. u.} \\ 7.0176 & \times & 646 & = & 4533.4 \text{ B. t. u.} \\ 4.5543 & \times & 562 & = & 2873.8 \text{ B. t. u.} \\ \hline & & & & 10430.0 \text{ B. t. u.} \end{array}$$

Evidently 2432 degrees are too high. A similar determination for 2232 degrees gives us 9403.4 B. t. u., which is less than the available heat and the actual temperature will be between 2432 and 2232 degrees and can be readily determined as follows:

$$10430 - 9403.4 = 1026.6 \text{ B. t. u. Difference for 200 degrees.}$$

$$9753.6 - 9403.4 = 350.2 \text{ B. t. u. Actual difference.}$$

$$\frac{200}{1026.6} = \frac{X}{350.2} \text{ from which we find X to be 68 degrees}$$

$2232 + 68 = 2300$ degrees, which is the possible kiln temperature.

If the air enters at 62 degrees it adds 89 degrees to the possible temperature, making a total temperature of 2389 degrees or cone 9.

On a preceding page we gave a table of possible kiln temperatures from an Illinois coal under different radiation losses and percentages of air. In Vol. XII, Trans. A. C. S. is a paper by T. W. Garve and the author, showing the method of determining kiln temperatures for coal, lignite and producer gas under varying conditions. We will not attempt here to duplicate this work, but in addition to the table already given, the following values have been worked out for a number of coals. The assumed conditions are, excess air, 25 per cent. and radiation loss, 20 per cent. The analytical data is taken from U. S. Geological Survey, Professional Paper No. 48, "Report on Coal Tests."

Kiln Temperature from Coal and Producer Gas.

Coal.	Moisture. Per cent.	Coal Temperature. F. Degrees.
Alabama No. 2...........	3.8	2603
Colorado No. 1...........	20.26	2482
Illinois No. 3.............	7.6	2597
Illinois No. 4.............	12.5	2561
Indiana No. 1............	11.3	2570
Oklahoma No. 1.........	4.6	2594
Iowa No. 2...............	16.5	2556
Kansas No. 5............	4.3	2628
Kentucky No. 3..........	7.08	2585
Missouri No. 2...........	11.58	2561
Montana No. 1...........	11.49	2549
No. Dakota No. 2.........	39.28	2344
W. Virginia No. 1........	1.4	2633
W. Virginia No. 8........	2.57	2624
W. Virginia No. 12.......	1.54	2650
Wyoming No. 2..........	9.53	2554
Texas No. 2..............	33.7	2363

In actual average practice we will realize lower temperatures from the coal because of greater excess of air than estimated, and also because of greater radiation loss.

Fuel Oil.

In the preceding discussion of heat values we have confined ourselves chiefly to coal, and giving other fuels no consideration. Crude and fuel oils have been used extensively in burning clay wares, but the high price of oil has put an end to its use except in California, and in a few factories in the east, where the values of the ware will stand a high fuel cost.

California, with its large output of oil with an asphaltic base and in consequence unfit for direct use in engines, and without any other fuel at a reasonable cost, is naturally the field where oil will be used for a long time.

Every user of oil fuel has experienced initial troubles, chief of which is the difficulty of getting the heat from the furnace or burner over into the kiln with the result that the furnace arches and throats were melted down. The oil is brought to the kiln under pressure and sprayed into the furnace and atomized by steam or air under pressure. Whether steam or air is the better medium is a matter of opinion, but it is our opinion that the advantage rests with air. The advocates of steam say that the steam heats the oil in its passage through the burner and gives better atomization, that it aids in taking the heat from the furnace into the kiln, and finally that it is simpler in its application. Steam, however, does not support combustion and the air supply is dependent upon the kiln draft and the aspirating effect of the spray of oil and steam. Some of the steam may be converted into water-gas which, as has been stated, serves a good purpose as a carrier of heat, but water vapor has a thermal capacity double that of air or of the gaseous product of combustion. Steam is troublesome to use for low temperature fires on account of excessive carbonization clogging the burners, but the chief fault is that such a large volume of steam causes excessive condensation in the cooler parts of the kiln. The introduction of secondary air necessary for complete combustion has been a problem where steam was used, and in a number of instances this has been worked out by building a double furnace, or constructing an air flue under the furnace floor extending to the back of the combustion chamber. Many old plants changing from coal to oil simply paved the grate-bars with bricks and thus had the double construction which has proven to give better combustion results than a simple fire-box depending entirely upon draft and aspiration for air supply.

Everyone, too, has experimented with flash walls or some obstruction in the furnace to distribute the atomized oil in the combustion chamber and mix it with the air supply. The flash wall is desirable in the early stages of the burning but when the furnace has reached incandescence no flash wall is necessary.

Air has the advantage that it serves for combustion and there is much better control of the kiln atmosphere. Careful tests have shown that there is some economy in fuel in favor of air against steam, but the difference is not sufficient to warrant a change from steam to air simply for this economy. The air pressure is usually 20 pounds to 30 pounds, but there are some advocates of higher and others of lower pressure.

The early installations put the oil supply above the kiln level and brought the oil to the kiln by gravity, but the Insurance Companies put a stop to this. Now, the storage tanks for oil are under ground and the oil is either pumped direct to the kiln or is pumped into a stand-pipe, in which a constant head is maintained by means of an overflow back to the storage tank.

The stand-pipe is by far the better method, because the pressure is absolutely constant, the pulsations of the pump noticeable in the fires where the pump service is direct are eliminated, and no exact adjustment of the pump is required.

There are a number of patented burners on the market, and many home-made burners in use. There are three basic principles and all burners are constructed on one or the other of these principles. In general, there are two pipes, one for oil and one for air or steam and the nozzle of these pipes are so placed that the oil is sprayed into the combustion chamber. One pipe may be inside the other, the inner tube for oil and the outer tube for air or vice versa, or the two pipes may be side by side.

The atomization may take place inside the outer tube where the tubes are concentric or at its nozzle or the spraying may be entirely outside the tubes on the principle of a sand-blast where the material to be sprayed drops into the horizontal blast of the spraying medium. One important point in any burner is that the oil-control valve should be easily removable so that the nozzle can be cleared of any material clogging it.

The advantages of oil fuel are:

(1) Economy in labor.
(2) Saving in storage space.
(3) Elimination of hauling of coal and ash.
(4) No cleaning of furnaces.
(5) More compact yard arrangement.
(6) Close control of the combustion and kiln atmosphere.
(7) Quicker burning, which means greater capacity or fewer kilns.
(8) Cleaner ware.

The disadvantage, one and only, is the prohibitive cost of the oil.

The heating value of any oil may be determined from an analysis of Damour's method, but the oils average so closely to 19000 B. t. u. that any calculation of their value is not necessary. The thermal capacities of the products of combustion enable us to determine the stack losses in the same manner as for coal, but it is not of sufficient importance to repeat the calculations for this fuel.

(To Be Continued.)

LOYALTY.

Loyalty is an important subject in the public mind of the country today. Also there are many interpretations of what constitutes loyalty, and a quick resentment of anything interpreted as disloyalty to the government. Moreover, in its present temper the public is disposed to interpret as disloyal words, acts and attitudes which in more normal times would not be so considered, or taken very seriously in any way.

As a result of the great intermingling mixtures of old country national blood into the people of the United States there is at the present critical time many somewhat delicate complications of sentiment in the situation to deal with. One thing we can see plainly is, that actual and active disloyalty is intolerable and should be dealt with severely. On the other hand, there is some danger that in our jealous zeal we may interpret some things into disloyalty which are not so intended and cause humiliation and hardship to people who are loyal at heart, yet are so mixed in their sympathies that they find the way difficult.

Every right-thinking man should appreciate that some of those whose hearts were with Germany, for example, before we entered the war are now, through their sympathy with Germany and their loyalty to the United States somewhat at sea and are undergoing some mental struggles of their own in readjusting their feelings and actions. In many cases there is an undoubted loyalty to the United States, but a sympathy on the other hand which is somewhat dissatisfied with the turn of events, resulting in a natural disposition to seek an outlet. One usual form of outlet is to find fault with the political party in charge. In normal times criticism of those directing the affairs of our government is very generously tolerated, but right now is a splendid time to lay off from free indulgence in criticism of this kind, lest it be interpreted as disloyalty to the government itself.

There may be blunders made and errors of political judgment. We could not hope to escape that, no matter what political power were in charge, or how able all the men at the heads of various divisions. There will be some criticisms of these things, too. Also some justification of the criticism, and good results coming from it, because it is the freedom of the criticism that helps prevent errors and their repetition. It is a splendid time, however, to put the soft pedal on efforts of this kind and remember that the main thing is to co-operate in every way practical with the different departments of the government, to the end that we may accomplish the greatest good for the whole country. Let us not lose sight of that aim and in an exasperated moment throw a monkey wrench into the machinery of the government, for criticism of this kind, while it may be important and necessary, occupies a secondary place just now. The main thing is to make good. We *will* make good, even though blundering somewhat; but let us make good with as little internal friction as possible.

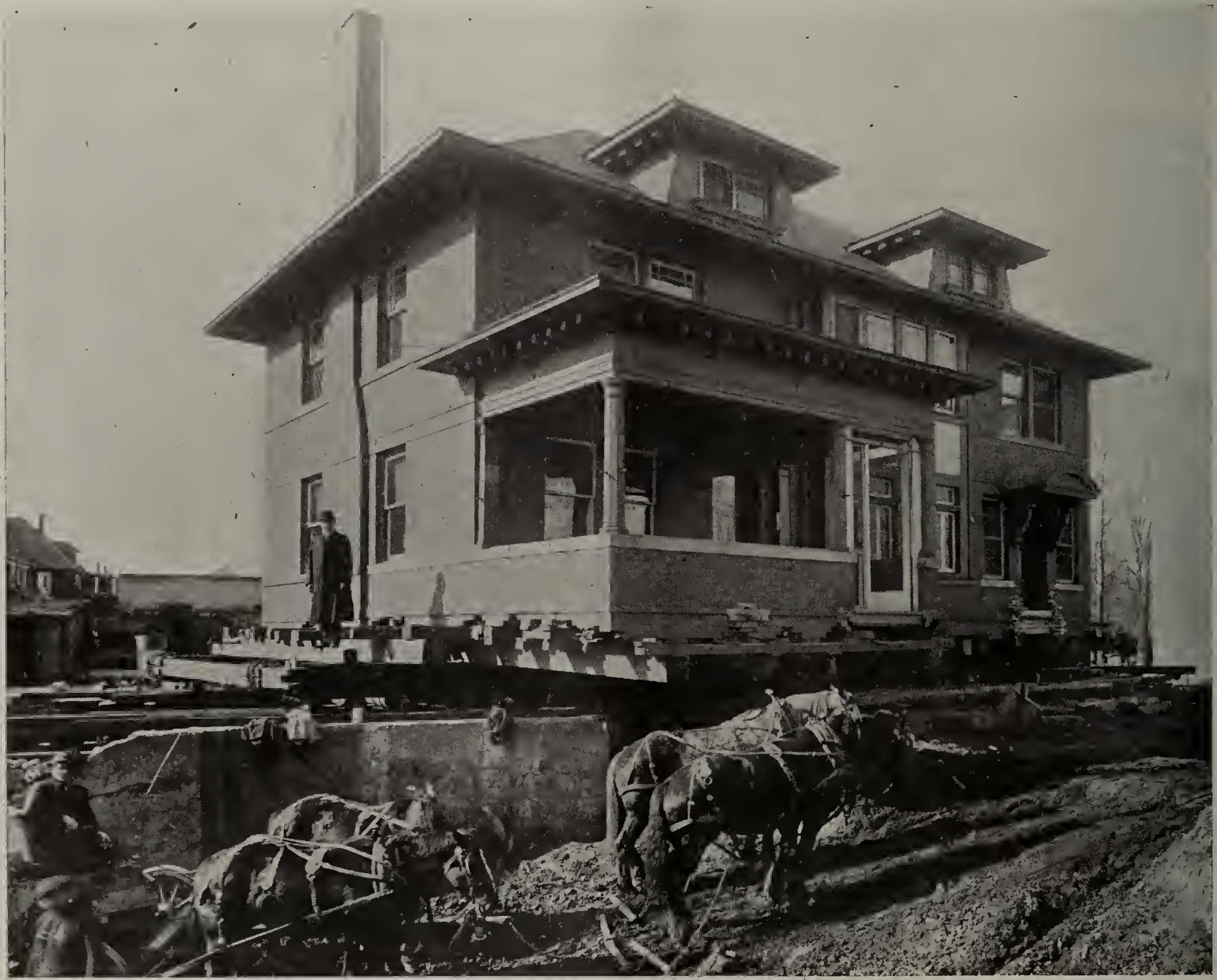
To those with German sympathy who are fundamentally loyal to the United States as a whole, but may be inclined to question the wisdom of acts of the President and his advisors, we would make the plea that they take for granted the absolute honesty of intent and assume that the government authorities have knowledge and understanding to guide them which for the time being is denied to the layman, and accept on faith things that are not easily understood or readily approved.

Meantime, let us keep eternally before us this thought: Loyalty to the government is the first order of the day to all citizens of the United States, and it is an order that should be observed on all sides to the fullest measure.

MOVING A TWO-STORY BRICK HOUSE.

An Operation Involving Details Likely to Prove Interesting to the Builder.

IN MANY PARTS OF THE COUNTRY and more especially in the rural sections, the local builder is often called upon to consider as an essential part of his business experience, the moving of buildings of all kinds from one site to another, but in the larger cities and their vicinity the raising and moving of buildings is a separate and distinct trade in which those engaged in it make a specialty of the work. We have in the past presented several articles dealing with unusual operations of this character ranging all the way from that of a dwelling house to structures weighing thousands of tons.



Front View of Two-Story Brick House as It Appeared After It had Been Moved from Its Foundation.
—Courtesy Building Age.

At the present time we have the opportunity of bringing to the attention of our readers an operation which occurred in Detroit, Mich., and consisted in the moving of a brick dwelling with 12-inch walls and weighing approximately 200 tons. The building was not only moved several hundred feet, but in the course of its journey it was necessary to turn it entirely around in order to fit the new site upon which it was to be placed.

In the first of the half-tone illustrations presented herewith we show the appearance of the house as viewed from the front after it had been raised upon the cribbing and partially moved from its original foundations. The second picture shows a view of the rear of the house during the process of turning it around. The work was done by Edward G. Kaiser, 518 Field avenue, Detroit, Mich., who furnishes the following interesting description of the way the work was done:

In preparing the building for moving, the basement walls were pierced at intervals of 2 feet throughout the whole length and timbers pushed through opposite holes across the width of the building. Under these were placed lengthwise of the structure two 16x16-inch timbers. Under these again were placed about 100 jackscrews resting on blockings and which were used to raise the building 2 feet from its foundations. When this stage of the work had been reached, rollers were placed under the lengthwise timbers on runways which rested on blockings.

Two thousand feet of cable, six double sheaves, one capstan and one team of horses were used in the operation of moving. The building was moved one city block, during which it was raised 2 feet in order to cross a cement drive and turn half way about in order to face a cross street.

The house itself was 30x50 feet in plan, two stories in height and had solid 12-inch brick walls. The work was completed without check or injury of any kind to the building. It is interesting to state in this connection that Mr. Kaiser makes house-moving and raising a specialty, he having executed many interesting jobs of work of this nature. It is to him we are indebted for the loan of the pictures from which our half-tone engravings were made.

It is easy enough to find a lot of things that seem higher in price than they ought to be. The trouble is to find the man who is responsible for it because every fellow gets out from under when the blame-fixer comes along.

MILWAUKEE AND WISCONSIN BRICK AND BUILDING NEWS.

BRICK, BRICK EVERYWHERE, and not a single brick to spare, may sound like the lilt of a nursery rhyme, but at bottom it rests on more truth than nonsense. For can there be better evidence of the demand of any commodity than the assurance that the sources of its supply are being steadily increased in magnitudinous means to meet the almost desperate demand?

"Never before have I experienced such a demand for brick," said a prominent building material man a short time ago, and what he said may be dittoed as often as there are brick interests in the State of Wisconsin, for in the brick industry, as well as in any phase of human existence, "actions speak louder than words," and if anybody who doubts the practicability of brick as a material for any kind of construction were but to step into the brick area of the Badger State for a little look over the situation, he would go away assured that brick is high in the popular demand.

The Marshfield Brick and Tile Company, Marshfield, has acquired a big 60-acre farm adjoining the brick property, a transaction which places 80 acres of fine brick property in possession of the company.

"The acquisition of this land is a part of a program of general expansion," said Louis Hartl, president of the concern. "Beside the enlargement of the yard, the company has plans of enlarging the plant to increase the output. The construction of two additional brick burning kilns, the doubling of the drying capacity, and the erection of a boarding house for such of the employes as have no homes near the works were mentioned as the principal items of contemplated improvements."

In its enlarged state President Hartl estimated that the output of brick would be about 36,000 a day. Mr. Hartl stated that the company's capital stock was recently increased and that the added funds of resource were easily made, the supplementary stock being taken by Marshfield people.

Down at the brickyard of the Whitewater Brick and Tile Company, Whitewater, everybody is busy pushing work on the two new kilns which are being installed to facilitate accommodating the large number of orders constantly piling up from all parts of the state. The demand for the products of the plant is far in excess of what can be produced under conditions of equipment adequate a year ago.

Brick was the choice for a paving material to be laid on five streets in Janesville. Members of the board of public works, after all due deliberation, came to the conclusion that brick is the thing, and, as the result of their decision, Franklin, North Bluff, Jackman and South Main streets and Garfield avenue will be lined with brick of the wire-cut type, said to possess over other varieties the advantage of eliminating rumble and rattle by virtue of the fact that no rounding edges predominate. Bound with cement, it is decreed the pavement par excellence.

"We have every good reason to expect a good street at actual cost," is the editorial comment in a recent issue of the Merrill Herald, and the explanation of that comment is in the simple remark that brick will be used.

"Cost of construction is a little higher than usual, although the paving blocks are almost the same price as formerly," continues the Herald, "cement and labor being the principal items of expense." There's a reason.

President D. F. Zuill, of the Whitewater Brick and Tile Company, realizing that the growth of the business is demanding more and more the personal attention of its president, recently resigned to accommodate the accession of Albert Hanson to the executive chair. The retired president has many and varied interests that swerved considerable of his time and consideration to fields other than brick and tile.

Rear View of Brick House as It Appeared During the Process of Turning.
—Courtesy Building Age.

The Burlington Brick and Tile Company, Burlington, has secured a large order for drain tile from the Wisconsin Drainage Commission of Elkhorn to be used for the East Troy drainage district. They are to be delivered during the summer at Mayhew station, Walworth county.

A three-day run of brick at the Thomas Larson plant, in Shawano, was recently frozen in the sheds, damaging the product for a total loss. This is the latest time in the season that the concern has ever experienced such a severe frost. With the order files flooded with persistent demands for brick to meet the heavy building demand, the Larson plant was for a time incommoded, for there was no surplus stock on which to draw.

Because of the big call for brick, Zerrenner Brothers, New

London, were recently compelled to rush through their first kiln of brick this season with a burn of only 175,000. It was figured that the accumulation of orders might be somewhat counteracted by the emergency drying. About 300,000 will be burned every two weeks during the rest of the season. All the men in the plant are receiving top-notch wages.

Bayfield, Wis., one of the most progressive towns in the Lake Superior district, is a strong proponent of "Pave with Brick." The city council has just awarded a contract for paving seven blocks with vitrified brick, on a sand foundation, with asphalt binder. The contract went to Sweeney Bros., Reedsburg, Wis., who were low bidders at $1.85 per square foot for paving, which price makes the average cost to property owners $1.80 per front foot, according to local statisticians.

A. BADGER.

PACIFIC COAST NEWS.

THE WAR SITUATION does not seem to have had a bad effect on building of this city or of the coast as a whole. In San Francisco the total value of the building permits issued during May was $2,889,000, the largest valuation for any single month in many years. This shows a gain of $1,260,000 over the month of May, 1916, which was a good average month. In Los Angeles the month of May shows up rather poorly in the valuation of the recorded permits, being only a little over three-quarters of a million dollars; but this follows right after a $2,700,600 total for April, so that it is evident that the southern city is not dropping off any. There is an unusually large amount of large work under way down town; and, while a lot of this is mainly concrete, a good deal of brick and tiling are called for. Among the projects started or soon to be started, the new theater to be erected at Eighth and Market streets for the Turner & Dahnken circuit of motion picture houses, the new D. O. Mills building on Pine street near Montgomery street and the new club house for the San Francisco Golf and Country Club at Lakeside will rank as the largest.

A number of California and Pacific Coast municipalities made changes in their building laws, but most of these will not have much effect on the use of brick in structures to be erected. Oakland, on the east side of San Francisco bay, has amended its statutes to read that class C buildings can be built in any part of the city and also has made a few modifications regarding the use of brick in homes, so as to popularize the use of this building material.

At Portland, Ore., it has been ruled that brick must be used in all buildings over thirty feet in height, this being the limit placed on frame structures. Other legislation affecting the brick men was the passage of Senator Flaherty's bill authorizing submission of separate bids on the brick or terra cotta work on all future state buildings. This will be a big help, as heretofore the brick manufacturer who wished his product to be considered for these new structures had to make some arrangement with a general contractor before this could be accomplished. State work scheduled for the near future means some business and includes the new normal school to be erected on the site of the old California building at the exposition grounds in this city, and several small additions to the various state hospitals.

There has been a general advance in brick prices throughout the state recently, especially on faced brick and enameled stock. The average gain has been $2.50 per thousand, although some particular lines have registered even larger gains.

Arthur S. Cunningham, vice president and general manager of the California Clay Corporation, has returned from the East, where he went to purchase machinery. Work will now be begun immediately on their $65,000 factory at Ione for the manufacturing of fire brick. The plant is to have a capacity of 3,000,000 bricks per annum and a large amount of this output has already been contracted for by the United States Navy for use in government vessels on this coast. This plant will make a specialty of high-grade fire brick, something which has not been turned out on the Pacific Coast before this.

Another Ione industry that has made very rapid strides of late is the mining work on the Theo. Dittell Company holdings. Contracts with a San Francisco firm for the delivery of 10,000 tons white sand per year for five years have been entered into and the first lot is to leave Ione on the 10th of this month. The sand is reported to be the equal of English sand in making "White bottles" and Mr. Dittell states that within a year his company will be producing porcelain and vitreous chinaware. A factory will be established at Carbondale, a half mile from the mine, for the refining of glass sand and china-clay kaolin.

M. M. Miner, M. Empena, J. Benedetto and L. A. Steiger, the latter formerly connected with the Steiger Terra Cotta & Pottery Co., has opened the Antioch, Cal., pottery works, which have been idle for several years. Orders for carboy stoppers, 50,000 lead pots and a quantity of 36-inch pipe—to be made by hand—have already been received and Mr. Minor, who has charge of the plant, expresses the belief that enough business can be developed to operate the plant the year round. At present he is bringing the most of his clay from the Ione section. Five kilns are available for present use, and this number will be increased shortly.

The Southern Pacific Brick Company has opened its Exeter, Cal., plant for the season, and reports a number of good sized orders for this summer. Already 330,000 brick have been delivered in a week and a half.

C. E. Shaffer, of San Francisco, who claims to have the financial backing of L. C. Dodge, a bath tub manufacturer of Michigan, and J. S. Lochin, a New Mexico capitalist, has applied to the San Diego city council for a lease on tidelands. A plant costing $75,000 for the treatment of magnesite and the manufacture of its products into bath tubs will be erected. The new company is known as the Mexican Magnesite Importation Company, and material is to be secured from recently discovered deposits of magnesite in San Diego county and Lower California. Shaffer is connected with the San Francisco Chemical Company.

A report of the Bakersfield Brick & Tile Company to the California Railroad Commission shows a net operating loss for the year of 1916 of $1,103.

The Richmond Pressed Brick Company, of Richmond, Cal., has installed a new brick machine with a daily capacity of 40,000 brick, and is preparing to put in a number of new kilns and make other improvements to the total cost of about $30,000. The company reports a continuance of the brisk demand which has been a feature of this year.

O. W. Stoner, of the California Brick Company, recently made a trip to Santa Rosa to interest the Petaluma & Santa Rosa Electric Railway Company's officials in the use of brick in paving their right of way. As yet, E. H. Maggard, general manager of this company, has not announced his decision in the matter, but it is believed that the award will be made to the brick concern.

The Federal Construction Company, of San Francisco, was recently awarded the contract for laying vitrified brick pavement on Castro street, near Beaver street, their bid being 35 cents per square foot.

M. Thomsem, president of the Denny-Renton Clay & Coal Co., Seattle, was a recent visitor to San Francisco. He reports business in the Northwest as very good, and says that all of the plants in that section are working at full capacity.

The Porterville Magnesite Company has recently put its new kiln, having a capacity of fifty tons daily, into operation. This is one of the largest kilns on the Pacific coast.

E. R. Simons, a brick manufacturer of El Centro, Cal., spent several days in San Francisco this month. He was here to purchase some additional equipment for his plant.

W. R. Simons, of the Simons Brick Company, of Los Angeles, was recently chosen vice president of the Builders' Exchange in that city. He will represent the brick manufacturers on the board of directors, with W. E. Stardley, representing the brick and masonry contractors on the same body. The latter is also chairman of the house committee.

The McGonigle Lumber Company, of Flagstaff, Arizona, has opened its brick yard at Riordan, for the summer and reports a good sized bunch of orders on hand.

The Los Angeles Pressed Brick Company has been awarded the contract for furnishing the brick for the new bank at Jerome, Arizona, and for the Hotel Parish at the same place. The Los Angeles Pressed Brick Company is operating all four of its plants with a full force at the present time.

The Thompson Brick & Tile Company, of Eureka, Cal., reports a good business in ordinary brick and tiling. Being located in an agricultural and milling section, the demand for tile has been especially good of late. J. D. Thompson is manager and owner of the plant.

The Warrenton Clay Company, of Astoria, Oregon, has been awarded the contract for making the souvenir mugs for the annual convention of the Oregon State Grange in Astoria. In addition to the usual lettering, a metal reproduction of a royal Chinook salmon is worked in.

San Francisco, June 1, 1917. SUNSET.

BUTTON-HOLE TALKS.

A Perfect Day Amid Western Scenes.

THE RIDE BACK from the Canon was a dream. The day was perfect and we breathed in deep breaths of the invigorating air to wash out the soot and smoke of the citified lungs we had brought with us. We skirted steep slopes and precipices; we looked out from great heights; we dove deep down into canons and climbed out again, but mainly our course was down for the first thirteen miles. We looked out, far across the Rio Grande, over broad mesas far below which our road would later lead us and so went on down and down until we crossed the Rio Grande. Then on through ravines and across dry river beds until we caught the sunset glow on the Sange de Christo Mountains, and Orville, keeping his eye on the road and whirling his machine in and out in its snaky course, told us the legend of the mountains.

W. D. Gates.

How a young Padre, who had sinned in Spain, came among the Indians, to make atonement, to make reparation for his sin. How he pressed ever farther and farther forward until he reached these Indians. How he labored and sought to teach them the simple doctrines of his religion and, in a measure, seemed to succeed. How finally, the jealousy of the Medicine Men led them to so work on the minds of the Indians and rouse them till they slew the Padre. How he lay dying until the sunset, praying his God to show him some sign that his sin was forgiven, that his reparation was acceptable, that his atonement was complete. That then, when he raised his head at sundown for a last look, he saw these mountains, bathed in the brilliant red of the sunset, and took it for his answering sign and died content. That the Indians stood appalled at the sight, as did the Jews at the crucifixion, and said his religion was indeed a true religion, and they have ever since called these mountains the Sange de Christo Mountains, the Mountains of the Blood of Christ.

So we went on, climbing and diving, until we came out in the gathering dusk on a great height while the sky to the east was a great opal, glowing and fading into tints impossible to describe, while away to the west it gleamed in fire and gold and made the sky a glowing throbbing ruby.

Then, five miles ahead of us, there flashed the lights of Santa Fe, and we sped on to our hotel with its waiting dinner and bath, and our eight days in the El Rito de Frijoles, the Indian Twon-yon-i, was a memory.

Today we prospected about the quaint old town of Santa Fe, again visited the old Governor's Palace where, over four hundred years ago, they built their adobe walls on the prehistoric walls of a former edifice. Viewed the room that was the seat of their empire and in the plaza in front of which all the stirring events of their time had transpired. Visited the room in which General Lew Wallace wrote the concluding chapters of Ben Hur; by the window was a chair in which he sat and the identical lapboard on which he wrote. Then the museum, in which we viewed the relics of the prehistoric life taken out in the excavation of the ruins among which we had spent the previous happy days. We saw the rather gruesome little shattered quartz arrow found imbedded in the spine of a skeleton, a very vivid illustration of what a little thing can end the fitful dream of life when properly—or improperly—applied. We hung over one little case containing a half dozen or so small crude dishes found buried with the skeleton of a little child. What a story this little case tells, of love and affection, of heartbreak and desolation. Just as the little one of today, seeing her mother at her household tasks, makes her little cakes and pies, so this little one of the long ago, imitated her potter mother and left the very impress of her baby fingers on the clay to faithfully preserve it for future generations and tell them its pathetic story. So when the little heart ceased to beat, when the gentle fingers had stiffened in death, when that great common mystery of death was brought home to these saddened mourners of the time remote, they wet with their tears these dishes wrought by her hands and now grown sacred and buried the toys she had made with her.

So another day is past. Another sunset has come, has glorified the mountains with its glowing colors, the darkness has settled down and the stars are flashing so gloriously and so near that we hate to go in and leave them. Were these spectacles not so common, so constantly recurring, we should be appalled by them, but their matter-of-face recurrence, the fact that we expect them every day, and day after day, renders us numb to their glory. So, we again turn the page of the day, with its record of good deeds, or of bad, written indelibly, and seek slumber peacefully, contentedly, with faith in another dawn and another day, hoping always for clear skies, bright sun and a better day even than the perfect one just past.

GATES.

SENSIBLE TRADE SCHOOL BUILDINGS.

Shortly a new type of school building must appear in every industrial center especially adapted to the various occupations and equipped therefor. The expense is much less than for high schools. They should be placed near high schools or other common schools so that children in the regular schools who are about to enter employment can easily prepare themselves by going for part of the time to the industrial school. This training will largely supersede that meaningless, ineffective stuff which we have called manual training, says H. G. Miles, in American Industries.

Into a school located close by elementary and high schools where manual training is taught, the working children of the city can come for one or two half days each week to be taught the occupation they elect, and manual training pupils can get the manual instruction they ought to have, which is very different from what most of them now get. Instruction can be specialized to any extent that the situation warrants and for any number of pupils, particularly when the central vocational school's equipment is supplemented by class instruction in shops.

These schools are complementary to the present academic schools. They can carry instruction to the highest point circumstances warrant and for all ages, the older workers coming mostly for evening instruction. By them and not otherwise will our great democracy become educated, efficient, broadly intelligent and happily co-operative. This is not a theory; it is a statement of facts, of things now accomplished in Europe generally, and in several places in the United States.—Building Age.

Kiln Department

PRODUCER GAS FIRED TUNNEL AND COMPARTMENT KILNS.

By R. H. McElroy, Sales Manager, International Clay Machinery Co., Dayton, Ohio.

FOUR to eight dollar coal is at present cutting a most serious figure in the industry. Plant after plant in those regions farthest away from the fuel producing section has shut down on account of this same fuel cost and the inability in many instances to obtain it at any cost.

Bulletin No. 8, Department of Ceramics, University of Illinois, details the following tests on Down Draft Kilns:

BUILDING BRICK:
Temperature 1,994° F.
6⅛-lbs. burnt weight
Coal required per 1,000 brick, 1,433 lbs.

A Producer Gas Fired Continuous Kiln in South Carolina is burning

BUILDING BRICK:
Temperature 1,850° F.
5½-lbs. burnt weight
Coal required per 1,000 brick, 285 lbs.

A saving when reduced to the same tonnage of about 75 per cent. in fuel alone.

The same Bulletin details:

PAVING BRICK:
Temperature 2,030° F.
7.23-lbs. burnt weight
Coal required per 1,000 brick, 2,389 lbs.

A Producer Gas Fired Compartment Kiln burning

PAVING BLOCK:
Temperature 2,100° F.
10-lbs. burnt weight
Coal required per 1,000, 1,200 lbs.

A saving on the same tonnage basis of approximately 66 2/3 per cent. in fuel.

A year's record on Zanesville, Ohio, Down Draft Kilns burning

PAVING BLOCK: (Average per year)
Temperature 2100° F.
10-lbs. burnt weight
Coal required per 1,000, 2,908 lbs.

A Producer Gas Fired Continuous Kiln burning

PAVING BLOCK: (Average per six months)
Temperature 2,100° F.
10-lbs. burnt weight
Coal required per 1,000, 652 lbs.

A saving on the same tonnage basis of approximately 77 per cent. in fuel alone.

One does not wonder from the remarkable savings produced, that there are now in active operation about 44 Producer Gas Fired Continuous Kilns in the United States and Canada.

Producer Gas Fired Kilns in common use for ordinary clay products are of two kinds:

No. 1, Tunnel Sectional Type, as per Fig. 1.
No. 2, Compartment Type, as per Fig. 2.

Tunnel Kiln.

This is an improved modification of the old ring tunnel kiln, and is built in several ways, enbloc as per Fig. 1 in two batteries with court between, or in one long single battery.

It is especially fitted for the burning of building brick and hollow-ware, in fact, any ware that is commonly burned in the tunnel type of kiln.

In actual performance, the Gas Fired Tunnel Kiln gives such results:

1—BUILDING BRICK—South Carolina Installation:
Temperature 1,800° F.
5½-lbs. burnt weight
Coal required per 1,000 brick, 300 lbs.

2—BUILDING BRICK—Georgia Installation:
Temperature 1,850° F.
5½-lbs. burnt weight.
Coal required per 1,000 brick, 300 lbs.

3—BUILDING BRICK—South Carolina Installation:
Temperature 1,850° F.
5½-lbs. burnt weight
Coal required per 1,000 brick, 285 lbs.

The particular Tunnel Kiln shown in Fig. 1 is arranged for top firing, but similar arrangements have recently been perfected for side bag wall, also bottom firing, the bag wall type being designed particularly for higher classes of ware, such as paving brick, roofing tile, in fact, all those products which heretofore have been burned most successfully in Compartment Type of Kilns.

Compartment Kiln.

These have for some unknown reason become more prevalent for all classes of ware than the Tunnel, they being

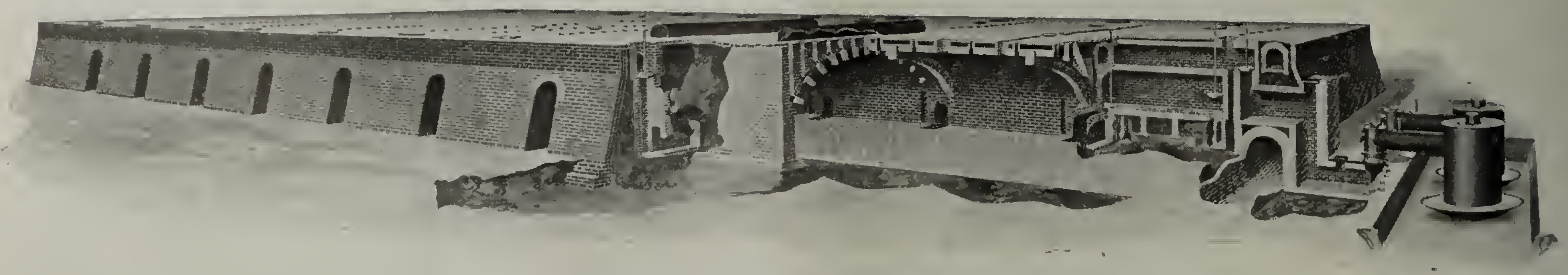


Fig. 1. One Type of International Producer Gas Fired Continuous Tunnel Kiln.

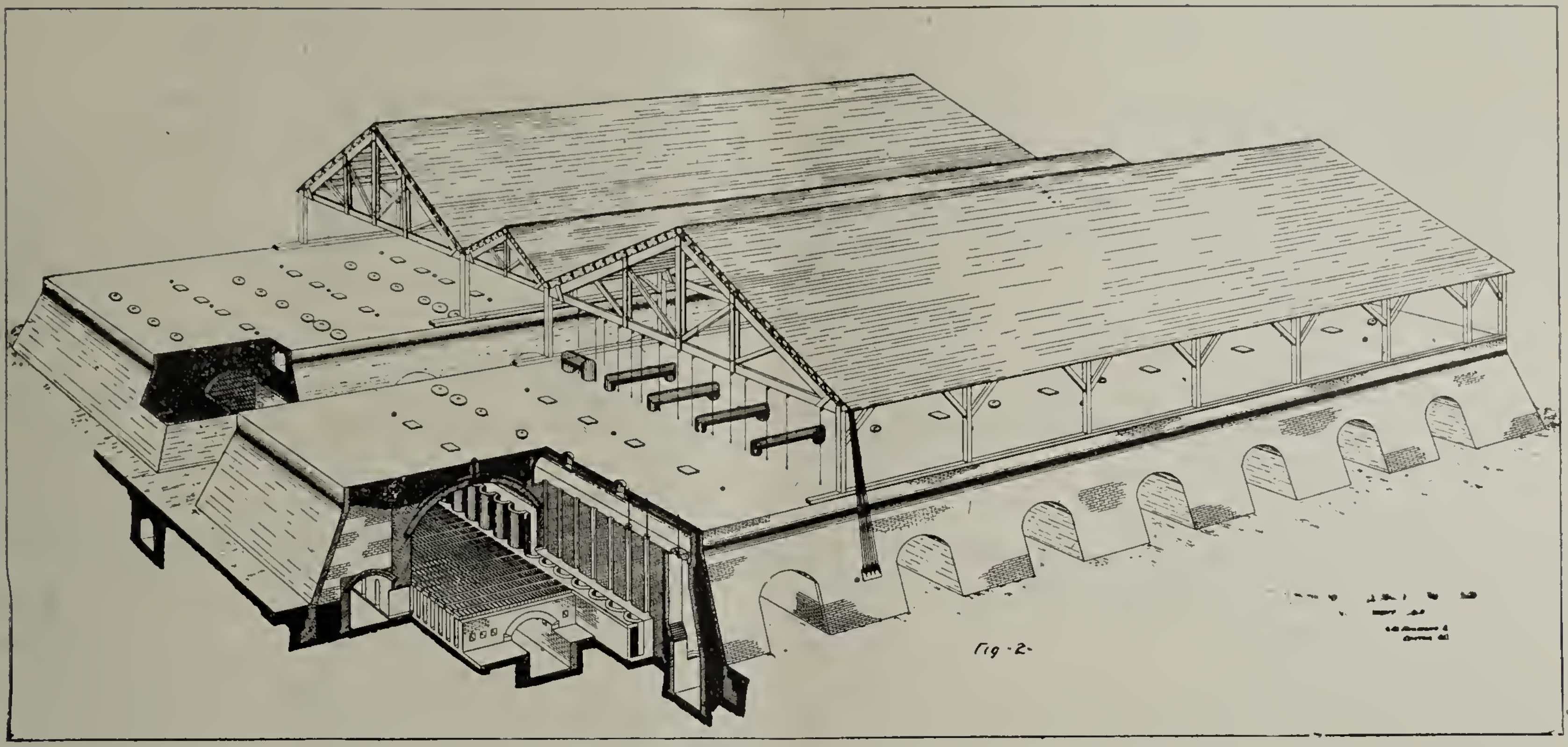


Fig. 2. International Compartment Battered Wall Continuous Gas Fired Kiln with Single Bag Wall to Chamber.

built in a variety of ways, enbloc, two batteries with court between as shown in Fig. 2, and in single battery as Fig. 6.

The kiln is constructed with either straight side walls or battered sides, depending upon local conditions and the whim of the builder.

Until lately practically all were constructed with a single bag wall per chamber. Recently the double bag wall, Fig. 5, is coming in, it being claimed that expansion and construction troubles are less when so constructed.

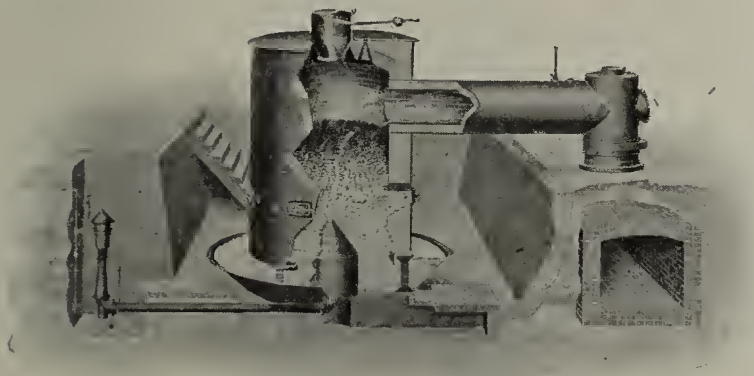


Fig. 3. International Circular Water Sealed Pressure Gas Producer.

Fig. 4. International Gas Fired Compartment Kiln, Double Battery.

A few actual burning results follow:

1—BUILDING BRICK—Canadian Installation:
Clay, gray burning glacial drift,
Temperature 1,800° F.
5½-lbs. burnt weight
Coal required per 1,000 brick, 285 lbs.

2—BUILDING BRICK—Canadian installation:
Clay, glacial drift burning red and gray,
Temperature 1,900° F.
5¾-lbs. burnt weight
Coal required per 1,000 brick, 365 lbs.

3—PAVING BLOCK—American installation:
Temperature 2,150° F.
10-lbs. burnt weight.
Coal required per 1,000 block, 1,200 lbs.

4—BUILDING BRICK—Tennessee installation:
Clay, surface deposit,
Temperature 2,300° F.
5½-lbs. burnt weight.
Coal required per 1,000 brick, 450 lbs.
(Remarkable showing.)

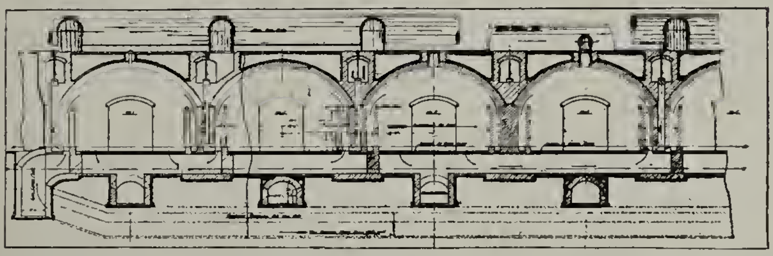


Fig. 5. International Double Bag Wall Compartment Kiln.

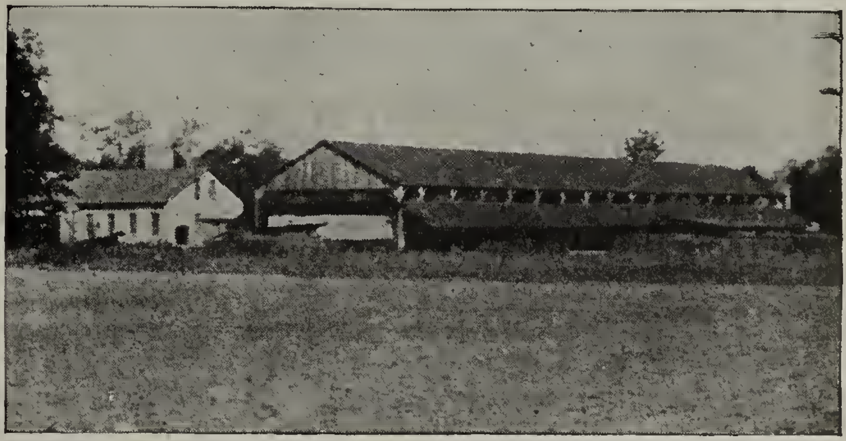


Fig. 6. International Single Battery Compartment Kiln.

5—HOLLOW-WARE, DENISON TILE—Canadian installation:
Temperature 1,850° F.
Coal required per ton, 108 lbs.

6—FACE BRICK—Ohio installation:
Temperature 2,200° F.

6-lbs. burnt weight
Coal required per 1,000 brick, 850 lbs.
(All brick flashed.)

7—BUILDING BRICK—South Carolina installation:
Temperature 1,800° F.
5½-lbs. burnt weight
Coal required per 1,000 brick, 300 lbs.

8—FACE BRICK—Michigan installation:
Clay, coal measure, fire clay,
Temperature 2,100° F.
6-lbs. burnt weight
Coal required per 1,000 brick, 600 lbs.
(Some flashed.)

9—BUILDING AND FACE BRICK—Arkansas installation:
Clay, surface variety,
Temperature 2,100° F.
5-lbs. burnt weight
Coal required per 1,000 brick, 326 lbs.

10—FACE BRICK—Canadian installation:
Clay, Hudson shale,
Temperature 1,800° F.
5½-lbs. burnt weight
Coal required per 1,000 brick, 320 lbs.
(Kiln shown Fig. 4.)

Comparison of above results with up and down-draft kiln practice in various sections of the country and Canada, under similar conditions, shows an astounding saving in fuel, comparing with similar data given in first part of article.

Gas Producer.

Fig. 3 shows a 6-foot internal diameter producer of the pressure circular water-sealed type, which producer has practically supplanted the old rectangular producers formerly used. It gives a richer gas, is easier controlled, and is not subject to air leakage as are all rectangular producers not steel jacketed.

A test made on the rectangular type of suction producer in 1916, under the auspices of the University of Illinois, gave the following results:

Coal used 12630 B. t. u. (Dry basis.)

Coal composition:

Fixed carbon	41.30
Volatile matter	44.48
Ash	9.52
Sulphur	4.71
Moisture	0.00

Gas analysis as follows:

Carbon dioxide (CO_2)	4.3%
Carbon monoxide (CO)	24.4%
Methane (CH_4)	1.5%
Hydrogen (H_2)	7.4%
Oxygen (O_2)	0.6%
Nitrogen (N_2)	62.1%

A recent test on a hand stoked pressure circular producer gives the following results:

Coal used 12830 B. t. u. (Dry basis.)

Coal composition:

Fixed carbon	53.16
Volatile matter	35.41
Ash	7.22
Moisture	4.21

This fuel gives the following gas analysis:

Carbon dioxide (CO_2)	7.9%
Carbon monoxide (CO)	23.4%
Methane (CH_4)	2.1%
Hydrogen (H_2)	17.1%
Ethylene (C_2H_4)	0.4%
Oxygen (O_2)	not shown
Nitrogen (N_2)	49.1%

Notice the high percentage of inflammable hydrogen in the pressure producer gas as compared with the gas in the rectangular producer.

Why the Producer Gas Fired Continuous Kiln?

A summary comparison between the gas fired continuous kiln and the ordinary up and down-draft kilns shows the following advantages in favor of the gas fired continuous kiln:

1—The saving of from 50% to 75% in fuel bill alone.
2—The saving of at least 50% in labor, due to the centralization of the coal and ash.
3—Greater facility in handling.
4—A greater uniformity of results due to greater mechanical operation.
5—High percentage of A1 ware due to the kiln design and mechanical operation.
6—A clean color similar to that which natural gas gives.
7—An approximate elimination of cooling checks in the ware.
8—An absolute control of reducing and oxidizing conditions, due to the pressure on the gas, and the fan draft.

Cost Comparison.

A comparison of costs of installation and fuel consumption in a down-draft kiln unit as against a tunnel kiln installation (present day raw material prices and labor used, estimates not including maintenance, depreciation, or interest on investment), gives the approximate following results:

Product—Vitrified building brick.
Material—Shale.
Burning Capacity—30,000 per day.
Temperature—2050° F.
Building brick figured at $17 in the wall.
Fire brick figured at $50 in the wall.
Excavation and filling, average 40 cents a cubic yard.
Coal—$5 per ton delivered.
Burning Labor—$2.75 per man per shift.

1—Downdraft installation:
Twenty days figured to completely turn a 30-ft. kiln (average for the year)

Fire brick, 26,000 @ $50	$1,300.00
Building brick, 120,000 @ $17	2,040.00
Iron work	350.00
Excavation and filling 125 cu. yds	50.00
	$3,740.00

Holding capacity 30-ft. kiln, 80,000 vitrified building brick.
No. kilns required, 8; total cost installation of down-draft kilns, $29,920.00.

2—Producer gas fired tunnel kiln installation:
Kiln built enbloc 16 sections (holding capacity each section, 40,000) size of section, 18 ft. long, 20 ft. wide, 11 ft. high; capacity per section equivalent to 30,000 in 24 hours.

Fire brick, 125,000 @ $50	$ 6,250.00
Building brick, 900,000 @ $17	15,300.00
Ironwork, fans, producers and miscellaneous	9,000.00
Excavation and filling, 2,000 cu. yds. @ $0.40	800.00
Roof installed, fire brick shapes, concrete put in, installation of fans, producers and iron work, and incidentals, approximately	10,000.00
Grand total cost installation continuous kiln	$41,350.00
Grand total cost installation down-draft kilns	29,920.00
Excess cost of continuous kiln	$11,430.00

Burning Cost.

No. 1—Down-draft Kiln:

1,000 brick equal 1,200 pounds of fuel, 30,000 equal 36,000 pounds, or 18 tons per day @ $5 per ton for fuel	$ 90.00
Four burners, coal and ash men	11.00
Total cost of operation per day	$101.00

No. 2—Producer Gas Fired Tunnel Kiln:
1,000 brick equal 400 pounds of fuel, 30,000 equal

12,000 pounds, or 6 tons per day @ $5 per ton....	$ 30.00
Three burners and laborers	8.25
Total cost of operation of gas kiln per day......	$ 38.25

Saving per day of producer gas fired continuous tunnel kiln over down-draft, $62.75.

(Further saving brought about through a greater percentage of A1 brick, better color, less checking not considered.)

Three hundred working days in the year equals a yearly saving of $18,825.00.

$18,825 is 6% interest on approximately $313,000.00.

$18,825 per year saving means that the difference in cost of the two kilns will be paid in saving alone in less than one year's time.

$18,825 saving in one year's time should pay for the entire erection of the producer gas fired continuous kiln in two years and three months' time—45 per cent. dividend per year on the original installation cost.

Where is there another such investment for the clay-worker?

A DAY WITH "JIM" HOSKINS

A Trip Through the Plant of the Terre Haute Vitrified Brick Company, Where 60,000 Dunn Wire-Cut-Lug Brick Are Made Daily

IN THE HEART of the rich clay deposits of Indiana is located one of the oldest clay product manufactories in the Hoosier State, owned by the Terre Haute Vitrified Brick Co. The plant has the credit of being the oldest paving brick plant in Indiana. It was erected twenty-seven years ago. It has kept pace with the times, however, and is up-to-date in every particular. It is located five miles from the center of Terre Haute and to the northwest of the city. Every feature desired by a plant of this nature is to be found there—rich clay and shale deposits, several coal veins, sufficient water supply and railroad facilities, hardly excelled. Being but a few miles distant from Brazil, it is fortunate in sharing with that wonderful clay center in its natural resources.

James M. Hoskins, Manager of the T. H. V. B. Co.

There are many things of interest that draw the visitor to Terre Haute, and not the least of these is that royal, hail fellow-well-met James Hoskins. "Jim," as his friends love to call him, is a happy individual, who mixes fun with common sense, and although he is bubbling over with good humor, is a clever story teller and dandy after dinner speaker, this fact does not interfere one iota with his business.

When it comes to turning the dollars into bonds, "Jim" is right there for his company, and we congratulate the officers and stockholders in having such a good business head, one who stands high in the clayworking fraternity, as their manager, vice-president and treasurer.

To point out a little thing which shows "Jim's" personality, we wish to refer to a five-word expression which appears on their letter head: "Often rattled, but never embarrassed." When the reader is informed that their paving block stands a splendid rattler test, never exceeding 16 per cent. and generally 12 per cent. or under, you can see what meat there is in that pat expression. So splendid is the product turned out at the factory that they are experiencing a great demand and have booked orders for many months ahead. This is to be one of their best years, and that means that millions more of "Ironstone Block" are to be placed in country highways and city streets.

When we arrived at Terre Haute we found "Jim" on the job, as usual, and after a brief chat at the company's office, we were taken out to the plant by automobile for a few hours' pleasant inspection tour. The day was warm and one of those few really good days this season, so "Jim" was bubbling over with good humor and seemed to enjoy walking over the shale pits, climbing hills, towers and stairways, although he had seen these same surroundings thousands of times before. We left our coats at the plant office and boarded a dummy engine just outside, which was taking six empties down to the shale pit 2,000 feet distant.

Birdseye View of Terre Haute Vitrified Brick Co.

At the Shale Pit.

We found this a mighty busy place. Two steam shovels are used, one for stripping the overburden, and one in the shale pit proper. The equipment outside of the shovels consists of a well drill made by the Loomis Machine Co.; twelve four-yard side dump cars; two locomotives, one of which is a Davenport; a 12x15 saddle tank, and a small engine which operates a Pulsometer steam pump for removing water from the pit. The tracks are heavier than seen on the average plant, being 60 and 70 pounds. This is necessary because of the heavy hauling and grade.

The deposits of raw material found here are three to five feet of overburn, a clay of sufficient quality to make common brick; a 160-foot depth of shale overlying a seven-foot vein of coal, under which is a bed 320 feet deep of shale containing two good veins of coal. At the bottom of this great bed of shale is another vein of coal, which has been proven by drillings. There is still another bed of shale beneath this fourth vein of coal, which goes to an unknown depth, so the company has raw material to last for years to come. The upper strata of shale is very hard, being a tough flinty shale, most difficult to crush. Were the average clayworker to study this shale he would declare it was too tough a proposition for any manufacturing plant to try to handle, but it makes an excellent product, though much expense is entailed in preparing same. The shale has to be blasted down, the drill being used constantly. Six-inch holes, 30 feet deep and 15 feet apart, are made each day. They shoot two or three times a week, each shot of three holes taking 700 pounds of powder and 200 pounds of dynamite, giving about 1,000 tons of shale. Three hundred tons are used daily. Du Pont powder is used and has been found entirely satisfactory. In fact, the superintendent says there is nothing better on the market.

A Glimpse of the Shale Pit.

Breaking Up Huge Slabs of Shale.

The blasted shale is picked up by a steam shovel and dropped into four-yard cars. When filled a train of six cars is switched by the dummy engine to a point where it is connected with the large Baldwin engine, which has six loaded cars of crushed shale. The two engines then pull the twelve cars up the incline to a point where a switch leads to the top of the crushing plant. The dummy engine then connects onto the six cars of crushed shale, taking same to the plant, while the large engine takes the blasted shale to the top of the crushing plant, taking the empties back to the switch, and thence down a track which places the car directly under the crushed shale bins.

An Unusual Clay Crushing Equipment.

The crushing plant is an immense structure, with 36 and 48-inch brick piers, the building being 52 feet high and the top track 42 feet from the bottom of the pit. The shale is dumped to one side of the track down an inclined bed, made with heavy railroad track turned upside down with sufficient space between to allow material of a certain size to pass through into the bin below. Sixty per cent. passes through the "grizzly" into the bin, the rest through a No. 5 jaw crusher, made by the Good Roads Machinery Co. Six men are kept busy above the crusher hammering into large pieces the large blocks of shale. The capacity of the bin is sufficient for 500 tons daily. The hopper bin below the crusher has a gate in the bottom operated and controlled by a steering wheel. This crushing plant cost $20,000, but is considered a paying investment, for the shale is most difficult to crush and necessarily must be handled through a process of this kind. The thickness of the supporting piers of the crushing plant is necessary because of the great jarring experienced. Seventeen men are employed in the drilling, shooting and operation of the shovels; six men in the crushing department, with four men to run the locomotives, making a total of twenty-seven men employed in the preparation of the raw material before it ever reaches the plant proper.

Loading Crushed Shale Beneath Crushing Plant.

"Jim" Takes a Look at a Fine Burn.

The Machine Equipment.

Upon reaching the plant, the crushed shale is dumped into a bin from which it is taken on belt conveyors to the nine-foot dry pans—three Bonnot and one Frost. The ground shale is elevated to the third story and screened through four Bonnot piano-wire screens, from which it drops into a bin fitted with a Ceramic Supply and Construction Co. disc feeder, which feeds the material into a Bonnot heavy duty 12-foot pug mill as needed. A Bonnot Canton Special machine gives the material five feet of extra pugging, which makes seventeen feet of pugging all told, and forms the clay column.

A Freese automatic cutter cuts the column up into the Dunn wire-cut lug blocks, of which 60,000 are made daily. The green blocks are hacked on single deck cars, holding 430 blocks each. About one hundred and fifty car loads are made daily.

Brick Housing for 22-foot Fan.

Some Boys Who May be Drafted.

The ware is dried in an L. E. Rodgers nineteen-track waste-heat dryer, each track holding fifteen cars. The drying ability of this dryer was complimented highly by Mr. Hoskins. The dryer is equipped with two exhaust and two intake fans. One of the waste-heat fans is the largest on any clay plant in this country, being 22 feet in height.

After going all over the plant and up into a high tower belonging to the coal company nearby to take a birdseye picture of the plant, it was quite a pleasure to stand near this immense fan and get cooled off. Visitors will no doubt find this Mr. Hoskin's favorite spot during the hot days of the summer months, although he is quite addicted to the mineral water from the flowing well near the machine room, which furnishes most refreshing aqua pura.

The ware is burned in thirty 32-foot down-draft kilns, and Brown pyrometers are used in the burning. This system is an absolute necessity according to the manager. To use his exact words, "To be without it would be like locking the stable after the horse was stolen."

The trip through the plant was most interesting, and the day was full of pleasure for the writer. As we took a last look at the stock of fine paving blocks on the yard ready for shipment over the Big Four, S. I., E. & I., E. & T. H., or either of the four divisions of the C. & E. I., and heard the call from the office door that the auto was ready to take us to the train, we reluctantly repaired to the office, where a dust broom was hurriedly applied while the auto horn told us we had no time to spare.

SOUTHERN INDIANA BRICK AND BUILDING NEWS.

BRICK MANUFACTURERS in Evansville and southern Indiana report that trade at the present time is below normal, but that shipping business has been very good and that they have no complaint to make along that line. But the local trade, while it has been a trifle unsatisfactory, is expected to pick up with the coming of settled weather, and there promises to be considerable building going on in Evansville later on. The manufacturers report that the car shortage situation has improved a great deal the past month, and that they are now getting all the cars they want. They fear, however, that during the melon shipping season and later on, when the grain shipments become heavy, that there may be a scarcity of cars.

"Jim" gives an Imitation of a Man at Work.

The Standard Brick Manufacturing Co. at Evansville reports that during the past month they have had a good business in Chicago, Mattoon, Ill., and Lawrenceville, Ill. The company has furnished the brick for new churches at Morgantown, Ky., and Lewisburg, Ky.; also a fine brick residence at Morgantown, Ky. The company was also called upon to furnish the brick for a new store building at Madisonville, Ky. It will furnish the brick for the new Carnegie library at Newburg, Ind., and the new school building to be built at Marion, Ky.

A new brick mausoleum is being built in St. Joseph's cemetery at Evansville, the brick being furnished by the Standard Brick Manufacturing Co. A new brick fence is also being built on one side of St. Joseph's cemetery that will be used as sort of a garden wall. A brick fence is also being built at one side of Oak Hill cemetery at Evansville. Plans are also being drawn for a new junior high school building in Evansville, and it is expected that actual construction work will start this summer or fall some time.

John Andres, secretary and treasurer of the Standard Brick Manufacturing Co. at Evansville, was active during conscription day in that city on Tuesday, June 5, and served on one of the conscription boards.

Brick manufacturers in southern Indiana and western Kentucky towns are bothered just now about the fuel proposition. In Evansville coal is retailing at 15 and 16 cents a bushel, the highest prices on record, and some of the operators who are retail dealers say that the price may be double these figures by next winter. So the outlook is not very encouraging for the manufacturers. During the past few months coal has advanced over 100 per cent., and many of the operators refuse to make long contracts, as they state they would be foolish to do so when they think that the prices are to go considerably higher. The Vanderburg county grand jury, sitting at Evansville, is expected to make an investigation of the coal prices some time during the month of June.

On June 1 the Standard Brick Manufacturing Co. at Evansville made a voluntary increase in the wages of all its employes, the increase amounting to 10 per cent. John Andres, the secretary and treasurer of the company, said the increase was made in order that the workmen might be able to meet the problem of the high cost of living. Last December the company made an increase in the wages of the employes that amounted to 10 per cent.

On Monday, May 28, the new brick manufacturing plant of the Standard Brick Manufacturing Co. at Evansville was started for the first time, the factory starting on a small scale. Within a short time it is expected the factory will be running full time. The plant is located on the Illinois Central railroad and the Henderson traction line, between the city of Evansville and the Ohio river, and it has a daily capacity of 30,000 brick. The company recently bought eighty acres near the new factory, and the clay supply comes from this eighty acres, the clay being of fine quality.

A few days ago Henry Brinkman, the oldest business man in Posey county, Indiana, celebrated his ninety-second birthday at his home in Mt. Vernon. He has been actively engaged in business in Mt. Vernon for the past fifty years, and in spite of his years drives each day to his tile factory located a mile from Mt. Vernon and oversees and directs the work of a large force of men. He is hale and hearty, and says he expects to live to celebrate his one hundredth birthday anniversary.

H. C. Kleymeyer, general manager of the Standard Brick Manufacturing Co. at Evansville, returned a few days ago from a business trip to Louisville, Ky. Mr. Kleymeyer is a man of large business affairs. He is vice-president of the Southern Brick and Tile Co., of Louisville, and president of the West Point Brick and Lumber Co. at West Point, Ky., and was recently elected a director in the Wisconsin Smoke Consumer Co. that will sell a patent smoke consumer in the state of Wisconsin. The company was organized at Evansville.

Business is reported good with the Crown Pottery at Evansville. A. M. Weil, the efficient president of this company, has been sick a good deal of the time during the past winter and spring, but at this writing is greatly improved.

The West Salem Hollow Brick and Tile Co., of West Salem, Ill., has furnished the brick for the Lanterman homestead at Grayville, Ill.

The contract will be let in a short time for the new Catholic church at Rockport, Ind., the building to take the place of the church that was burned on Christmas day last.

The Rosiclare Lead and Fluor Spar Co. at Rosiclare, Ill., is building a Y. M. C. A. at Rosiclare for the use of their employes. The brick to be used in the new building is furnished by the Kleymeyer-Klutey Brick and Tile Co., of Henderson, Ky., and is being shipped to Rosiclare in barges sent down the Ohio river. The company also contemplates the building of a hospital for their employes.

The city of Evansville will, some time this year, erect a municipal depot at Howell, a suburb, that will cost about $75,000. The station will be one of the few municipal depots in the United States. It will be used by the Louisville & Nashville railroad and traction lines, and will be built with brick.

The Underhill Brick and Tile Co., of Rockport, Ind., a few days ago voluntarily raised the wages of its employes one dollar on the week.

The contract for the construction of Miller brick road in Knox county, Indiana, was awarded to S. R. Adams & Co., of Princeton, Ind., for $41,818. The contract for the construction of the Kramer brick road in Knox county was let to the same company for $52,927.

A small wind storm, about three weeks ago, struck the American Sewer Pipe Works at Brazil, Ind., blowing down three smokestacks and rendering the plant unfit for operation for one week.

R. C. Conant, manager of the Rockport Drain Tile Co. at Rockport, Ind., has moved his family to Rockport from Springfield, Ill.

The brickyard of the Southern Indiana Products Co. at Huntingburg, Ind., has been operating full time for some time past. The employes of this company were recently given an increase of 25 cents a day, and the plant is kept busy filling orders for high-grade face brick. The plant of the Dry Press Brick Co. at Huntingburg is also being operated on full time. Both companies report they have been experiencing considerable trouble in getting fuel.

A. HOOSIER.

OPENING FOR BUSINESS IN RUSSIA

New Conditions and the Enormous Natural Resources Found in the New Republic Afford Splendid Opportunity.

SOMETHING WAS SAID LAST MONTH about the clay-working industry in Russia, enough to indicate in some degree the opportunities for development which exist in that great, but little known, land. Nearly 200,000,000 people are just breaking from the bonds of semi-ignorance and undevelopment and are ready to come out into the light and grow along with the other great nations of the world.

Obviously under the conditions which have heretofore existed they have purchased practically nothing beyond their barest needs. While this may not hold good of the entire population it is true of the greater majority and therefore the opportunity to secure additional trade is but now opening. Those who are alert to the situation will be the ones to benefit by the revolution and the awakening which is certain to follow. Such a shattering and readjustment of the methods of living of the people, their changed political ideals and other influences will react helpfully upon business and the purchasing power of the entire nation will largely increase in consequence.

Sentiment exerts a powerful influence in business, more so than most business men are honest enough to admit. Accepting the truth of this and applying it to the present situation in Russia the possibilities for American commerce with that land are endless. Russia is looking toward America for aid. Indeed, she has already received the most substantial aid which can be given, a liberal loan, and now a commission from America is in that country for the sole purpose of advising and suggesting means for solving the problems of democracy with which she is confronted.

When the war is over and commerce can again resume its ordinary channels it seems certain that much of the Russian business will come to America.

To be sure it will never be a market for the export of brick, though our potters might do some business there only disigners would have to study Oriental ideas in decoration, else their offerings might be too plain. The Russian mind is largely Oriental in its manifestations and Russians prefer their goods, what ever they may be, made with some attention to Oriental decorations.

Talking of Russia and her greatness, together with some consideration of the opportunity which is now America's, B. Lipschitz, of the Russian-American Agency of Commerce, was very optimistic in his utterances.

"The trade of Russia is ready for America to take, if it will," he said. "We here have grown very optimistic regarding the proportion of Russian business, which will eventually come to the United States. If the goods sent there are what the Russians want, and if the prices can be made right, and they can, then the commercial development of that great country can be made a valuable trade asset to America.

"Business is constantly growing, even though it is seriously handicapped at present by lack of shipping. It is almost impossible to secure bottoms in which to ship goods, and because we cannot, thousands of dollars worth of merchandise is piled in New York warehouses waiting transportation. The people there want these goods, too, and have money to pay; but that is all useless when ships are not available to send them over.

"I am speaking now of general merchandise. Of course, special lines are in exactly the same condition. It is impossible to get anything over there at present, excepting on rare occasions. Only two ports are open, Vladivostok and Archangel. But the government requires all the available facilities for the prosecution of the war, and only two or three ships for the general public are permitted to enter or leave these ports in a week, and that number for a great country like Russia is infinitely small. Naturally we hope for better things, but we don't see any opening in the wall that bars us out. Later that will come, however, and then trade will increase faster than we have any idea is possible.

"Clayworking machinery is wanted to develop the immense clay deposits which abound. No one can estimate the quantity of clay which is suitable for use in making some sort of clay wares, running from brick through all the finer qualities to fancy pottery. In some instances Russians have made creditable pottery and their oriental decorations would make it popular here, and elsewhere if the industry should grow sufficiently to allow exports. At present not enough is produced for home consumption.

"Plenty of brick is made at home, but, of course, with modern methods of manufacture the output could be immeasurably increased. Clayworking machinery, such as has been used there was made principally in Europe, and in most instances in Germany. Some has gone from America, but the quantity is too small to amount to anything. Yet, the opportunity is there and those who want it and will go after it will get the bulk of the trade.

"I am well aware that commercial necessity will not long book failure to purchase such machinery where it is easiest available, and this, of course, leads irresistibly to the conclusion that Germany will regain the supremacy she exercised in the Russian markets before the war unless she has such competition as will prevent. Sentiment is strong, but it will not prevent the purchase of necessities where they can be procured most advantageously, no matter if that is from one who has been an enemy. It is easy enough to remember this sentiment at the moment, however, and thereby advance our own interests. The conclusion is too plain to permit dispute.

"Only one way exists to know what is wanted there, and that is to look over the ground. Catalogues in English are useless, though they are better than a representative who doesn't speak the language and possesses no sympathy with the people, or has no just appreciation of their greatness, or the greatness of their future. Invoke sentiment a little and secure good orders as a result.

"To state specifically what machinery is needed in Russia is not easy, but in a general way substantially everything used in the manufacture of clay will sell well. The future promises development of cities and extension of commerce in every direction, including much that previously has never been exploited. The inference is plain. It is for machinery men to go into the field with the intention of securing this trade, even though the country is so remote. The present war is jarring us all closer together, and we shall have to know each other, whether we want to or not. For that reason it will be well to study the opening presented in this particular division of industry and then proceed to go after the business in the only way that will insure securing it."

The fact that business with Russia has increased very rapidly despite all these handicaps, and was growing rapidly until the question of the commercial treaties came up under the former government, is ample proof of the possibility. The objection to renewal of those treaties is no longer vital, and the only real obstacle to full and free trading with Russia seems to be gone forever.

When one considers that the Russians have practically nothing, as it is known in this country, the extent of the opening for sales seems unbounded. It should stimulate the imagination and influence men to go far in an endeavor to secure trade. One need not fear. The business is there and can be obtained if those who make the articles wanted will go after sales; but they will not come without effort. The inference again is plain.

It hardly seems necessary to go over the ground covered in the previous article. Instead, the matter may be left here with the suggestion that those who desire to secure some of the trade of that country must prepare for the contest which will begin as soon as the present war ends.

MEETING OF THE SOCIETY FOR TESTING MATERIALS.

The twentieth annual meeting of the American Society for Testing Materials is scheduled for Atlantic City, June 26-29, with headquarters at the Hotel Traymore. In the preliminary program announcement, reports of committees on ceramics are down for the ninth session, Friday, June 29. The report of committee C-3 on brick will be made by Chairman Edward Orton, Jr.; committee C-4, on clay and cement sewer pipe, Rudolph Hering, chairman; committee C-6, on drain tile, A. Marston, chairman; committee C-8, on refractories, A. V. Bleininger, chairman; committee C-10, on hollow building tile, R. H. Provine, chairman.

THE GARAGE BOOK.

The Garage Book, a pamphlet published by the Permanent Building Society, of Des Moines, Iowa, is not only a timely publication but it is particularly pleasing in that it deals with the subject of building garages out of burned clay products in a graphic manner. It is filled with drawings and plans of single and double, one story and two story garages built of hollow clay tile. The clay products are undoubtedly the things with which to build the garage and this book of plans for hollow tile will help the cause along. Also it should be a hint to brick manufacturers to go do something likewise.

SPEAKING OF HOG HOUSES.

Over in Missouri, where the tradition is to show what it is you have got and not merely talk about it, they have been giving some attention to the subject of hog houses. The attention in this case has had to do with the relative merits of wooden houses and metal houses of the portable class. The State Board of Agriculture went into the subject at some length and issued a bulletin covering the results of experiments as to ranges of temperature in wooden houses and metal houses. One of the points made was that of the desirability of avoiding wide ranges in temperature. It is desirable to have warmth in winter and coolness in summer for fattening swine. This being true, while they are speaking of hog houses, why not introduce that "Build With Brick" sign, because that is the way to get relief from variations in temperature? The brick house is warmer in winter and cooler in the summer than one built of any other structural material. Admittedly, brick is not good for a portable house, it being the material of permanence. There is no reason why even hog houses may not be permanently erected and so well built with brick and paved inside and out that there is no occasion to move it. There seems to be an opportunity for some good brick boosting work in connection with hog houses.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Clay-Worker Ad Brought Results.

Editor The Clay-Worker:

Enclosed find check covering charge for my For Sale ad. We were fortunate in disposing of all of the machinery through this ad, and feel that we are indebted to The Clay-Worker.

Sawyer, Wis. E. J. SIMON.

Wants Brickyard Supplies.

Editor The Clay-Worker:

Please send me a sample copy of your magazine, and make note in your next issue of the fact that I would like to have prices on supplies for a small hand yard. My address for the present is Polster House, Baxter Springs, Kansas.

PHIL C. METZLER.

Who Can Supply Earthenware Jars and Jugs?

Editor The Clay-Worker:

I wonder if you can advise me where I can purchase earthenware fruit jars. Tin has advanced so much in price I cannot buy tin cans. I also want to buy some syrup jugs, 1 gallon sizes and smaller sizes as well. I would like to have my name on the jugs. Please tell me where I can get this work done. I need the fruit jars at once, but can wait a little while for the syrup jugs.

Magnolia, La. W. D. WESTBROOK.

Summer Meeting of New Jersey Clayworkers to be Held in Trenton.

Editor The Clay-Worker:

The summer meeting of the New Jersey Clayworkers Association will be held in Trenton on Friday, June 29. A note to the above effect in your next issue will be appreciated by us.

An afternoon and evening session will be held. A dinner at the Trenton Country Club is being planned during the intermission. An interesting and instructive program has been arranged for presentation at the meeting.

Thanking you for the favors of the past, I remain,

Very truly yours,

G. H. BROWN, Secretary.

Rutgers College,
New Brunswick, N. J.

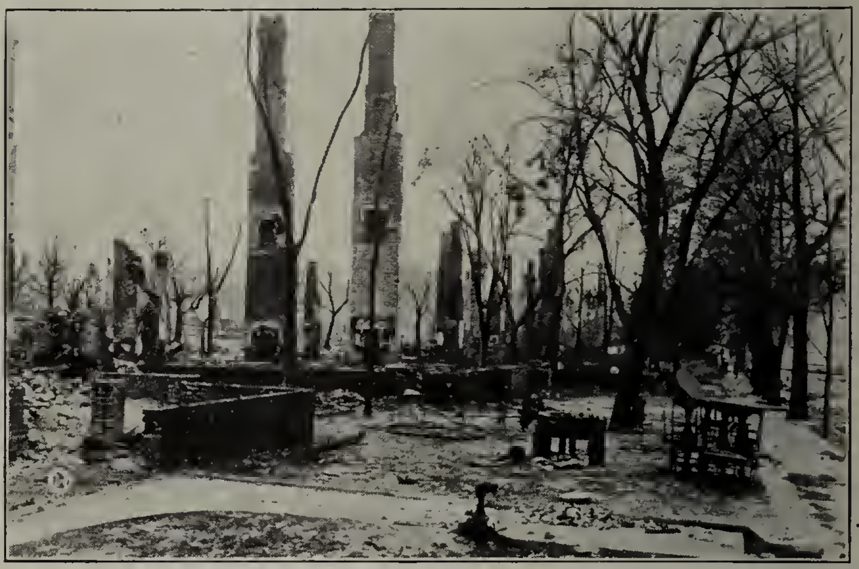
THE REAL YELLOW PERIL WHICH THREATENS AMERICA IS THE YELLOW PINE SHINGLE.

Editor of The Clay-Worker:

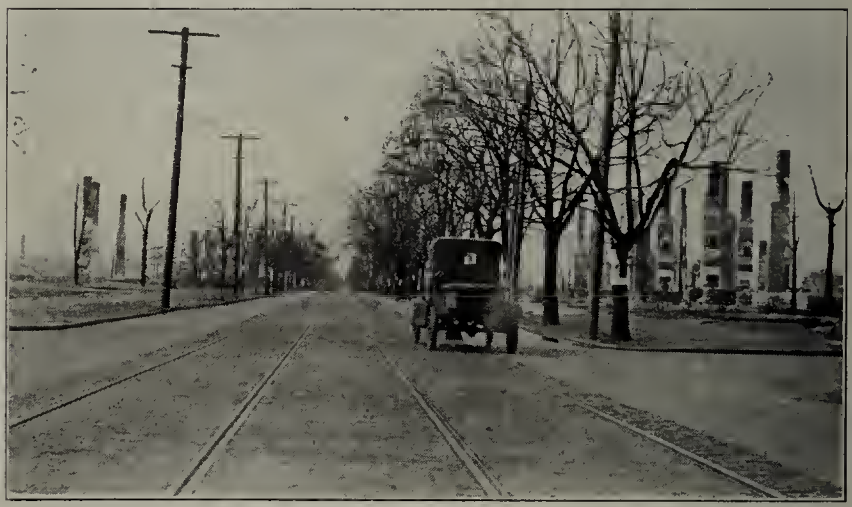
I was in Atlanta recently and took occasion to make a personal inspection of the district devastated by the recent fire, and the panoramic picture which I sent you will give you an idea of how utter the destruction was. It made me feel as if I was going over portions of Belgium and France through which the German army had retreated.

The grinning chimneys are ghastly testimony to the fact that brick is the only real fire-proof building material, and brick manufacturers at Atlanta were quick to take advantage of the psychology of the moment and posted thousands of The Clay-Worker signs throughout the burned area, proclaiming the slogan, "Build with Brick, the everlasting material."

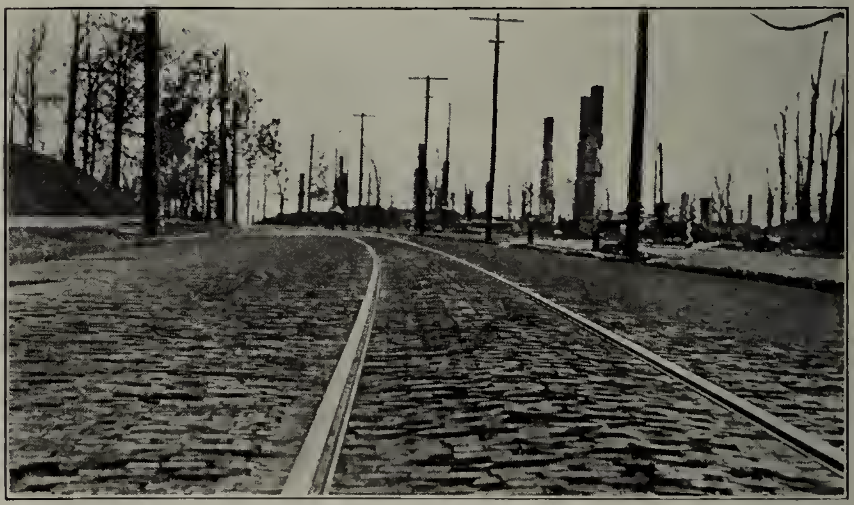
As I stood on the highest point and viewed the burned territory, I thought to myself that Richmond Pearson Hobson made a true prophecy when he said: "America was menaced by the great Yellow Peril," but to my mind, it is not in the shape of an Oriental race, but *Yellow* pine lumber and shingles



The "Grinning Chimneys" Attest the Unburnable Quality of Brick.



A Brick Pavement in the Burned District Uninjured.



A Wooden Block Pavement in the Burned District Badly Damaged.

This seems to be the judgment of the Atlanta Constitution, as set out in the editorial I am enclosing you from their issue of May 31.

The Shingle Roof.

"The press of the entire country, while giving Atlanta all credit for the heroic manner in which the fire situation was handled, is practically unanimous in its comment on the lesson of the fire, which is the elimination of the shingle-roofed tinder-box frame dwellings—applying not only to Atlanta, but to all cities.

"The Greenville (S. C.) News says that 'the time is coming when great fires like that in Atlanta cannot occur in cities, for the era of fire-proof municipalities is coming on apace. Modern building codes are condemning frame structures that so often supply the foundation of great conflagrations.'

"And the Louisville (Ky.) Times has this: 'The lesson Atlanta teaches to the balance of the country is adequate protection against fire loss, which Atlanta never has had; and which, in fact, few cities of her size enjoy.'

Apartment House That Would Have Escaped but for Shingle Roof.

Presbyterian Church; Find the Shingle Roof.

Block of Brick Buildings Which Checked the Fire at That Point.

"Other cities that have suffered from fires due to buildings whose construction made them a menace to the community, easy prey to the flames—the frame dwelling with the shingle roof—have profited by their experience, just as Atlanta will; and better buildings of fire-proof material have replaced the old.

"So, for all the suffering due to the fire, the lesson to Atlanta, as to other cities, is a wholesome one. It confronts the people in the ashes of frame-constructed buildings where shingle roofs predominate.

"Atlanta's burned districts are grim reminders of a calamity which wise fore-thought might have enabled us to avoid.

"The shingle roof must go!

"And it will go, now that the council seems disposed to put the anti-shingling ordinance into immediate effect.

"It should have become effective on January 1, of this year, but the time was extended, on appeal, to give dealers who had large stocks of shingles on hand time to dispose of them. So the operation of the ordinance was postponed to July 1.

"And no evasion of it will be tolerated. It is now time to stand pat, and the menace of buildings with roofs of inflammable materials that invite the flames must be done away with."

The fire began in the negro settlement near Decatur street and swept everything in its pathway for two blocks—all of the buildings being frame. It then encountered a solid block of one and two story brick stores with metal roofs, none of which were burned, as you will see from the accompanying kodak picture which I took. But on account of the fierceness of the fire and velocity of the wind, burning embers were carried over this brick barricade and gained renewed life in the adjoining block of frame buildings, and swept on for about a mile and a half to Ponce de Leon avenue, destroying some 1,500 frame buildings.

There were a number of brick residences and churches in this zone, which had wooden window frames and doors and frame and shingle roofs, which were gutted by the fire, but the walls are standing as monuments of indestructibility of the brick themselves.

A large number of houses that were destroyed by the fire in the residential section were pretentious frame buildings, many of which cost around $10,000, which should have been built of brick, and could have been at a very slight increase in cost.

I hope that the lesson of the Atlanta fire will be well learned, not only by that city itself, but hundreds of other cities and towns in the South, which are expending millions of dollars in buildings, and are apt to be destroyed in a very brief space of time.

As a matter of great interest to the paving brick industry, I am also sending two photographs of North Boulevard, which extends right through the heart of the burned district. One of these photographs shows the brick pavement that did not suffer any damage whatever, but a few blocks further on the boulevard is paved with wood block, and the picture shows how the pavement buckled up, and great holes were burned in the blocks themselves, necessitating the entire repaving of that portion of the boulevard. The people wanted wood block because it was not noisy, and the brick pavement is now making "a loud noise" saying: "Pave with Brick, the Permanent and Dependable Roadway." Staff Correspondent.

SEWER PIPE AND FLUE LINING LITERATURE.

The Sewer Pipe Manufacturers Association, with headquarters in Akron, Ohio, has been getting out some attractive and interesting literature dealing with both sewer pipe and flue lining. There are at hand three separate publications, one entitled "Clay Products for Building Construction," one "About Culverts" and one "Vitrified Clay Products."

The book entitled Clay Products for Building Construction, deals with flue lining and various special products and includes diagramed details of standard chimney construction, which were published in the Clay-Worker some time ago, as recommended by the National Board of Fire Underwriters. It is interesting to note in this connection that even the lumber people have exploited this same type of chimney construction. So there seems no room for argument even between the clayworkers and the lumbermen on the point of flue linings. This book also contains diagrams and specifications for drainage and it is profusely illustrated and of splendid typographical appearance.

The publication "About Culverts" goes into the technical details of estimating culvert sizes, designs, etc., and should prove a valuable addition to the library of engineers and contractors.

The publication dealing with Vitrified Clay Products goes into the history of sewer pipe for drainage purposes clear back to the dark ages, and tells the story of how salt glazing came about. It also includes description of how sewer pipe are made, tests required to determine the adaptability of material for sewer pipe and a lot of other interesting technical data in addition to profuse illustrations of sewer pipe plants and sewer pipe testing and laying.

The Sewer Pipe Manufacturers Association has undoubtedly gone to considerable expense in preparing these publications and they have displayed a commendable enterprise which materially aid in promoting the use of their products.

LET'S BUILD WHILE WE FIGHT.

Howard E. Coffin, of the Advisory Commission of the Council of National Defense, says: "No radically new condition confronts us. State activities, road building, public works, private industries, all must go on as before. Business must be increased, labor employed and the country kept going strongly ahead as a successful economic machine. We must have successful industries if successful tax levies are to be raised."

There should be no curtailment in building and road construction. Let both public and private useful construction proceed. Production and handling of building materials and public and private construction work are fundamental industries of the country. Any tendency to suspend or postpone building projects is inconsistent with maintaining our prosperity. The country is prosperous. Building investors should not hesitate to go ahead with their plans. Railroads should spare no effort to supply the building industry with the cars needed to transport materials. Government, state, county, and municipal authorities should encourage the continuance of all kinds of building. Road and street improvements should go on unabated. Bad roads and streets are factors of first importance in the present high cost of foodstuffs.

The lumber, brick, cement, lime, sand, gravel, stone, and other building materials industries are basic. If anything results in the prostration of so fundamentally important industries, there is real danger of a surplus of unemployed labor, a surplus of railroad cars and a crippling of business that will seriously embarrass the government in financing the war.

Keep on building.—Ohio Architect.

HISTORY REPEATS ITSELF.

Oft in our childhood days we were regaled with the nursery rhyme "The King of Spain Marched Up the Hill, and Then Marched Down Again." Just why he marched up, or just why he changed his mind when he reached the summit and double tracked back to the bottom, never was very clear to the childish mind and maybe the ancient king had no definite idea in view but was training a bunch of "rookies." In this respect the belt boys at the Purington Paving Brick plant, at Galesburg, Ill., while they emulated the Spanish ruler's example in marching up and straightway marching back, did have a definite purpose in their maneuvers, as tersely told by the Galesburg Mail, as follows:

"Belt boys of Brick Co. marched to office of company demanding more pay.

"Officers of company refused to comply.

"Belt boys marched back and resumed work."

Would that this incident might prove a shining example to men of older years. If the striking clayworkers of Brazil, for instance, had exhibited this same characteristic, peace would now reign in that section. As it is, one of the Federal Judges sitting in court at Indianapolis recently threatened to put the mayor, the police force and half the population of Brazil in the Marion county jail and take a hand in adjusting the troubles himself, if law and order was not restored in that community.

THE INDIANAPOLIS ROTARY CLUB'S OFFERING IN THE INTEREST OF THRIFT AND BUSINESS CONSERVATION

BY PERMISSION of the Rotary Club of Indianapolis, we reprint a copyrighted leaflet issued recently and distributed to the good people of the Hoosier Capital through the common schools. Fifty thousand of these leaflets were circulated in that way, with a view of bringing home to householders the extreme importance of thrift during the continuance of the war. We are sure our readers will find the leaflet of great interest, for one cannot overestimate the importance of conserving business and natural resources, especially food supplies, during these trying times. The data for this leaflet was compiled for the club by a special committee of its members assisted ably by Professor G. I. Christie, of the Purdue University, Lafayette, Ind., and his associates. It is authentic and is purposely presented in simple language readily comprehended by every householder, young or old. If any of our readers desire to put the leaflet in the hands of employes, a supply can be obtained for that purpose. This is one way for you to do your BIT.

KEEP BUILDING, SAY THE CEMENT MAKERS.

We are perfectly willing to present a bouquet to the Portland Cement Association for their enterprise under existing conditions. We may differ with the cement folks about some of their propaganda, and take issue with some of their arguments, but they have right along manifested an admirable spirit of enterprise in boosting their product, a spirit that we have longingly wished might be more in evidence in the brick fraternity.

In their latest efforts along this line the cement folks are circulating boosting matter to 150,000 dealers in building materials, contractors, architects and others. This is matter not only calculated to bestir these people, but it is also matter that can be used by the local papers, and the tune to the whole song is "Keep on Building."

They point out that Howard E. Coffin, of the advisory committee of the Council of National Defense, says that state activities, road building, public work and private industries must go on as before and that business should be increased, not decreased. Then the plea is made that there should be no curtailment in building. It was pointed out that the production and the handling of building materials are fundamental industries of the country and any tendency to suspend or postpone building projects is inconsistent with maintaining our prosperity.

Further, that the lumber, brick, cement, lime, sand, gravel, stone and other building material industries are basic, neither government regulations nor railway restrictions should be imposed to interfere with them. In fact, they point out repeatedly in different form in these boosting circulars the impressive need to keep right on building.

This is good stuff and we should heartily join in with the cement folks in boosting the idea. It is one proposition in which cement, brick, lumber and all other building material folks can make common cause. There is a disposition to postpone and let up on building operations, and we need all the boosting we can get to help keep this thing moving along.

How You *Can Do Your Bit* *and Help Our Boys* Win the War

Stafford-Indpl's.

The trumpet of war has sounded. From coast to coast the "sons of their fathers" are leaving the paths of peace for the paths of war.

From furrow and forest and factory—from the mines, the offices and the pulpit—the noble sons of Columbia are rallying to the battle cry:

"We are coming,
Father Woodrow—
2,000,000 strong"

Two million now—perhaps five million, ten million later—gallant free men are ready to sacrifice their lives on the Altar of Freedom that YOU, mother, father, sister, daughter may continue to enjoy the blessings of liberty, opportunity and democracy.

What sacrifice will YOU make for these two million fathers, sons and brothers to make their task of victory easier, quicker, surer? How will YOU do YOUR bit?

This pamphlet tells how you can render a most patriotic service to yourself and country, **right in your own home.**

"He Profits Most Who Serves Best"

“More than Seven Hundred Million in the United States of Ame

$700,0

These staggering figures are a terrible indictment of the American people---the most extravagant, the most wasteful and the most immoderate people in the world.

And, they are all the more shameless when it is considered that virtually every dollar of this criminal waste could be saved—utilized—**and very, very much to the benefit of our national health, wealth and prosperity.**

But it is enough now to point out the causes—the sources—of our national improvidence; to show how it can be stopped; and to plead with every man, woman and child to put his or her shoulder to the wheel for self and country and for the brave men who are preparing to sacrifice their lives and their fortunes for YOU.

How This Criminal Waste is Made Possible

1. **By eating more than is needed—more than is good for you.**
2. **By preparing more than is eaten.**
3. **By careless—or ignorant—handling.**
4. **By improper cooking.**
5. **By neglecting left-overs.**
6. **By throwing into the garbage pail or to the chickens perfectly good, nutritious, health, body, mind, blood, muscle and tissue-building food.**

Sons and daughters of America! In the name of liberty, justice and common sense, stop this criminal waste. It CAN be done if YOU will do YOUR bit.

The President's Appeal

> “Every housewife who practices strict economy puts herself in the ranks of those who serve the nation. This is the time for America to correct her unpardonable fault of wastefulness and extravagance. Let every man and every woman assume the duty of careful, provident use and expenditure as a public duty, as a dictate of patriotism which no one can now expect ever to be excused or forgiven for ignoring.”
>
> —President Wilson.

He Means YOU

President Wilson wants **you** to realize that wars are won as much by **food** as by men and munitions; that **right** now there is a **shortage of foodstuffs** in our own country; that by unselfish, patriotic and sane living we can reduce the unpardonable annual waste of over seven hundred million—$700,000,000—dollars' worth of foodstuffs which would go a long way toward feeding the boys in the trenches and in the training camps, which would enable us to make greater shipments to the Allies without robbing ourselves and causing us to feel too keenly the pinch of high prices.

But more than anything else, President Wilson wants **you** to feel **your** responsibility. He wants **your** co-operation.

Our Reserve Supply Exhausted

War or no war, we have it to do. Our reserve supply of foodstuffs is virtually exhausted now. Indications point to short crops this season. If we are to win; if liberty and democracy are to survive; if autocracy is to be crushed; if our national identity is to be preserved, we must consume only those foods which are necessary, and only in the quantities that are necessary, and **waste nothing.**

Economy Will Pay Big Dividends

Sane, intelligent economy will do you no harm. It will do you much good. Someone has said America is a nation of gourmands. We eat too much—more than we need—more than is good for us. Millions of Americans are suffering from maladies directly traceable to over-eating. Most of us would be healthier, happier and wealthier if we reduced the quantities of food consumed from ten to fifty per cent.

So, here's patriotism which will not only do a great good toward conserving our food supply, toward feeding the brave boys in the trenches and in the training camps, our own poor, but actually pay big dividends in health, happiness and prosperity.

Eliminate the thick, expensive steaks and roasts. Substitute the cheaper, thinner cuts and then eliminate some of these. Stop serving the expensive salads and "fussy" desserts. Your body does not require them. In most cases, it is better off without them.

Classification of According to Chief

For the convenience of the homemaker that will supply food requirements, a list of chief food constituent is given. If one food there need be little fear of lack of required

Protein Foods (Tissue Builders)	Starch Foods	Sugary Foods
Lean Meat Poultry Fish Oysters Milk Cheese Eggs Legumes Dried Peas, Beans, Soy Beans, Cow Peas, Peanuts Nuts and Similar Foods	Bread Crackers Macaroni Tapioca Rice Cereal Breakfast Foods Hominy Bananas Starchy Vegetables and Similar Foods	Sugar Syrup Honey Jelly Candy Preserves Marmalade and Similar Foods

00,000 Dollars Worth of Food is Wasted rica Every Year"—*Secretary of Agriculture*

What Your Food Must Do

For you to be well nourished your food must do only three things:

1. Furnish building material for the body tissues—so that they may be normally developed and kept in good condition.
2. Supply heat and energy.
3. Supply regulating material so that the processes of digestion, circulation and elimination may take place normally.

To provide proper food and in the proper quantities it is not necessary to gourmandize. Neither is it necessary to go hungry. It is necessary only to know the relative values of foodstuffs and the actual requirements of the family.

"Building Material" Foods

Building material is supplied by protein foods—meats (the cheaper, thinner cuts are just as good), fish, eggs, milk, cheese, nuts and the dried legumes, beans, peas, soy beans, cow peas, etc. Mineral matter in small amounts is needed but let fresh vegetables and fruits supply this. Water obtained from fresh fruits, vegetables and beverages also plays an important part in that it is the basis of all fluids of the body and all food must go into solution before it is utilized by the system.

"Heat and Energy" Foods

Heat and energy are supplied by the carbohydrates—sugars, starches and fats. Sugars are largely obtained from sugar cane, beets and fruits; starches from cereal grains and such vegetables as potatoes, sweet potatoes, etc., fats from fat meats, milk, vegetable oils—olive, cotton seed, corn, etc.

Common Foods
Food Constituents

who is trying to plan an economical diet common foods tabulated according to the from each group is found in every meal nourishment.

Fatty Foods	Fruits and Watery Vegetables	
Butter Cream Lard Drippings Olive Oil Cotton Seed and Salad Oils Fat Meat Oleomargarine Bacon Chocolate and Similar Foods	Apples Oranges Berries Peas Melons Rhubarb Dates Figs Raisins Prunes Apricots Carrots and Similar Foods	Greens String Beans Green Peas Cabbage Tomatoes Turnips Asparagus Salsify Squash Lettuce

"Regulating" Foods

The acids and mineral matter found in fruits and fresh vegetables regulate the body. Outer layers of grain serve the same purpose. This is largely why graham flour is so valuable. Water acts as a regulator and a flush which carries away poisonous toxins. Drink at least three pints daily, either "raw" or in the form of beverages.

Protein Foods—Tissue Builders

Protein is both necessary and expensive. Therefore, it should receive first consideration when planning economy.

The dried legumes—peas, beans, etc.—are the cheapest sources of protein. Use them more generally. There are many ways of preparing them. Don't overlook cow peas and soy beans. They are the cheapest in price, are highest in protein value and have a pleasing flavor. All dried legumes are greatly improved by soaking in lukewarm, soft water for twelve hours and cooking in soft water until well done.

Cheese has high protein value, requires no cooking and is no waste. Consequently, it is a cheap source of protein, rather than an extravagant one, as is sometimes supposed.

Milk, Eggs and Fish

Milk is a valuable source of protein and mineral. At ten cents a quart milk protein is comparatively inexpensive and every child should have at least a quart of milk a day. Eggs are a valuable source of protein and even at high prices can well be substituted occasionally for meat. Canned and preserved fish, because of low cost and small percentage of waste should be used more frequently. They add variety.

Meat protein is expensive and is more apt to decompose in the intestines. Meat protein need not be served more than once a day and may well be served even less frequently. When meat is desired the same food value, at much less expense, can be had in the cheaper cuts. By careful cooking they may be made quite as palatable as the more expensive cuts.

Valuable yet Inexpensive Foods

The most valuable source of food material as well as the less expensive, is the cereals. They are rich in starch and protein. There is little variation in the food value of the different grains, wheat flour, rye flour and corn meal come about the same. As these cereals are much needed across the seas, great care should be taken that none is wasted. Eat more graham and the coarser grades of flour instead of the expensive wheat flour.

Good Substitute for Potatoes

With potatoes variously quoted at from $3.00 to $6.00 a bushel, we can do ourselves a real service by finding substitutes. Rice, macaroni and spaghetti will serve splendidly. Rice is much better if cooked in a large amount of boiling salted water, which should boil rapidly during the entire cooking. As soon as cooked, drain the rice in a colander, and then pour hot water over it to wash off surplus starch particles, keep the grains separate and avoid a pasty mass. Don't waste the water drained off. Use it in making soups, escalloped dishes, etc.

Thick corn meal mush, seasoned with onion, if desired, fried in deep fat, is a delightful substitute for potatoes. Artichokes—sometimes found growing wild and which may easily be cultivated—have the same food value as potatoes, are much esteemed and should be used in their stead. Sweet potatoes also can be used as a substitute.

Value of a Mixed Diet

A mixed diet is the most satisfactory in the end. Moreover, it is easily possible even with limited means.

Prepare fewer dishes for each meal. To have the table loaded is neither appetizing nor economical. Make a business of varying the method of preparing foodstuffs. For instance, instead of having greens cooked plain, make them into a cream soup, thickened with egg or moulded. If these two points are remembered you will have little difficulty in providing sufficient variety.

How to Eliminate Waste

1. Prepare right amount. To prepare more than is needed is neither good management nor economy.
2. Utilize left-overs. Use before it dries up or spoils. Small portions of left-over food can be used in many ways without much trouble. Many people have a soup pot in which left-overs are used. Chowders, croquettes, escalloped and many other dishes may be made of combinations of left-overs.
3. Serve reasonable portions. Too frequently food is served and not eaten.
4. Waste no fat. Fat is one of the expensive food elements that improves the taste of many dishes. Too often butter and other expensive fats are used when drippings or less expensive fat would serve the purpose equally well. No fat should be thrown out.
5. Care of food in the home. Food waste often results from improper care in the home. Therefore, protect food from dust and flies, keep as cool as possible without freezing, keep from evaporating (in the case of green vegetables).
6. Prepare carefully. Peel vegetables carefully or cook in jackets. As much as 20% of the edible portion of potatoes is in many cases discarded.

Save water in which vegetables and cereals are cooked. It contains valuable mineral salt. Cook properly. Underdone, over-cooked or scorched food is likely to be wasted.

Season well. Poorly seasoned food will be left on the table and probably wasted. Serve attractively. The appearance of a dish adds much to the way it is relished.

How to Prepare Left-Overs and Other Economical Foods Palatably

Hash

Remove bones and gristle and chop meat. To each cup of meat add two cups of chopped potatoes; one-half teaspoon salt and a speck of pepper. Mix thoroughly. Put two tablespoonfuls dripping into fry pan, add the hash and let it cook slowly until browned on the bottom.

Casserole of Rice and Meat

Steam one cup rice, three cups boiling water, one teaspoon salt; one quarter teaspoon celery salt, one-eighth teaspoon pepper, one teaspoon chopped onions, two tablespoonfuls cracker crumbs, one egg, one cup hot water or stock.

Steam rice twenty minutes. Chop meat very fine, add all seasonings, then add beaten egg, cracker crumbs and stock or hot water, enough to pack easily. Line the bottom and sides of greased mold or small bread tin one-half inch thick with cooked rice, pack in meat, cover closely with rice, then cover with greased paper and steam forty-five minutes. Loosen around the edge of mold, turn out upon a hot platter.

Scalloped Meat

2 cups cold meat
¼ teaspoon pepper
3 tablespoons fat
1½ cups hot meat stock or water
1½ teaspoon salt
¼ teaspoon onion juice
3 tablespoons flour
2 cups bread or crackers

Make sauce with the fat, flour and seasoning and add one-third cup hot stock or water and the rest gradually. Put one-half of crumbs in a baking dish, pour sauce mixed with meat (cut in small pieces) in dish, cover with crumbs and brown in oven twenty minutes.

Spanish Hash

Cut in small pieces left-over beef and add whatever gravy is left, one can corn, pimentoes to suit taste and raw potatoes or onions. Bake in casserole about ninety minutes.

Steak Birds

Small pieces of thin round steak (raw) in which are rolled one slice of bacon and half an onion; tie up and dredge in flour and brown in frying pan. Add a pinch of butter and hot water to cover; let simmer for ninety minutes.

Chuck Pot Roast

Salt and dredge in flour about four pounds chuck beef and brown thoroughly on both sides in skillet; add hot water and vegetables (carrots, turnips, onions, etc.); let simmer for two hours. This makes delicious gravy.

Stuffed Flank Steak

Bread (that has been soaked in water), one egg, one onion, salt, pepper, makes a delicious dressing for stuffed flank steak. Spread on flank steak, season, roll it up and tie and roast in tightly covered pot. Serve with gravy.

Croquettes

Chop cold meat into small pieces; add salt and pepper. Roll in crumbs and brown in hot fat.

Codfish Balls

2½ cups potatoes
1 cup salted codfish.
1 egg
⅛ teaspoon pepper
½ tablespoon butter

Wash in cold water and shred fish. Wash, pare and cut potatoes in pieces, cook the fish and potatoes together in boiling water until potatoes are soft. Drain very dry over fire. Mash fine, add butter, seasonings and beaten egg. Beat well, shape on a spoon and drop in deep hot fat. Fry until browned and drain on brown paper.

Fish Cakes

1 cup cold fish
1 cup cold mashed potatoes
1 egg well beaten
salt and pepper
celery salt

Equal parts of cold mashed potatoes and shredded cold fish. Mix. Season to taste. Add beaten egg, shape in rounds, cook in spider with two tablespoons hot fat until nicely browned.

SAVE THE STALE BREAD

Bread Pudding

1½ cups stale bread crumbs
2 tablespoons sugar
¼ teaspoon salt
1 pint milk
1 tablespoon melted butter
2 eggs
1 teaspoon vanilla or
¼ teaspoon spice

Soak bread crumbs in milk; add sugar, butter and egg slightly beaten, salt and flavoring. Put in buttered pudding dish and set dish in pan of hot water. Bake in moderate oven thirty minutes. Try with knife. If knife comes out clean the pudding is done.

Stale Bread Dessert

Slice some stale bread, one egg, one cup milk, two tablespoons butter, one tablespoon sugar. Cut bread in one-half inch slices. Beat the egg slightly, add milk and sugar. Dip bread in this mixture, moistening both sides, heat the butter in a spider and fry bread on both sides a golden brown. Serve hot with a little jelly spread on each piece.

Bread Griddle Cakes

1½ cups fine bread crumbs
1½ cups hot milk
2 tablespoons butter
2 eggs
½ cup flour
½ teaspoon salt
3½ teaspoons baking powder

Mix in the order given. One cup any cooked cereal may be used instead of bread crumbs. Cook as any griddle cake.

Corn Meal Muffins

¼ cup butter
½ cup sugar
2 eggs
½ tablespoon salt
1 cup milk
2 cups flour
1 cup corn meal
4 teaspoons baking powder

Cream the butter, add sugar, then eggs beaten without separating, until light colored and thick. Into this stir alternately the milk, flour and corn meal, sift it with the baking powder and salt. Beat thoroughly and bake about twenty minutes in hot buttered gem pans.

Graham Gems

½ cup flour
1 cup graham flour
¼ teaspoon salt
3½ teaspoons baking powder
1 egg
¾ cup milk

Sift the flour and do not use the bran left in the sifter. Sift again with the salt and baking powder; add the egg well beaten and enough milk to make a stiff batter. Bake in buttered gem pans fifteen minutes.

Salmon Pudding

1 small can salmon
1 tablespoon butter
1 cup bread crumbs
½ teaspoon salt
⅛ teaspoon pepper
1 egg
1 cup hot milk

Remove skin and bones from salmon and rub fish fine with potato masher. Melt butter and milk, add crumbs and seasonings. Combine with fish. Lastly, add well beaten egg, put in buttered deep baking dish and steam one hour. When done turn out on platter and pour over the following sauce:

Sauce

1 tablespoon butter
1 cup milk
½ teaspoon salt
1½ tablespoon flour
liquid from salmon
few grains cayenne

Melt butter and flour and slowly pour on hot milk, then add salmon, liquid and seasonings.

Potato Soup

3 potatoes (cut small)
2 teaspoons chopped onions
½ teaspoon salt
1 quart boiling water
⅛ teaspoon white pepper
2 teaspoons chopped celery
2 teaspoons parsley (chopped fine)
2 tablespoons butter
1 tablespoon flour

Heat one tablespoon butter, add the onions and celery, and let simmer ten minutes. Add potato, cover and cook two minutes. Add the water and boil one hour. Add more boiling water as it evaporates. Bind the remaining flour and butter and serve hot. Any cold cooked vegetable, left over, may be added.

Originated by the Rotary Club of Indianapolis

Suggested Menus

A few suggestive menus show the variety it is possible to have at comparatively small expenditure. For dinner, two vegetables, a protein dish, bread and butter and a simple dessert are recommended. For lunch or supper, one hot dish, bread and butter, milk and a dessert. These menus have proved satisfactory even for people doing heavy manual labor. With minor changes they should meet the needs of the average household.

Menu 1

Breakfast..Stewed Prunes, Oatmeal, Toast, Creamed Codfish, Milk and Coffee.
Dinner....Flank Steak Roast, Dressing with Gravy, Rice, Bread, Lettuce, Cherry Pudding.
Supper....Corn Chowder, Gingerbread, Rhubarb, Milk and Tea.

Menu 2

Breakfast..Stewed Apricots, Cream of Wheat with Bran, French Toast with Syrup.
Dinner....Pot Roast of Beef with Gravy, Brown Potatoes, Graham Bread, Lettuce Salad, Prune Pie.
Supper....Escalloped Lima Beans, Bread, Pineapple Tapioca, Milk and Tea.

Menu 3

Breakfast..Bananas, Oatmeal, Bran Muffins, Milk and Coffee.
Dinner....Cottage Pie, Creamed Lima Beans, Graham Bread, Apricot Rice.
Supper....Tomato Soup with Rice, Saltines, Banana and Pineapple Salad.

Menu 4

Breakfast..One-half Orange, Farina, Corn Griddle Cakes, Milk and Coffee.
Dinner....Meat Loaf with Brown Sauce, Creamed Macaroni, Escalloped Tomatoes, Bread, Brown Betty.
Supper....Macaroni and Cheese, Graham Bread, Stewed Prunes, Milk.

Menu 5

Breakfast..Apple Sauce, Cracked Wheat, Creamed Beef on Toast, Milk and Coffee.
Dinner....Escalloped Eggs with Ham, Baked Potatoes, Bread, Orange Snow.
Supper....Tomato and Kidney Bean Stew, Graham Bread, Apple Tapioca, Milk.

Menu 6

Breakfast..Stewed Peaches, Oatmeal, Graham Muffins, Milk and Coffee.
Dinner....Creamed Codfish, Baked Potatoes, Bread, Buttered Beets, Cherry Pie.
Supper....Cheese Souffle, Graham Bread, Peach Cobbler, Milk.

Menu 7

Breakfast..Stewed Figs, Cream of Wheat with Bran, Frizzled Ham, Milk and Coffee.
Dinner....Boston Baked Beans, Brown Bread, Creamed Onions, Lemon Jelly.
Supper....Potato Soup, Saltines, Fruit Salad, Peanut Cookies.

Rice Griddle Cakes

2 cups hot boiled rice
2 cups flour
3 teaspoons baking powder
1 teaspoon salt
1 pint milk
2 eggs

Mix ingredients. Beaten eggs are added to the milk. Combine the two mixtures and lastly fold in the beaten whites, cook as griddle cakes.

Vegetable Soup

1½ quarts boiling water
⅓ cup cabbage, cut
¼ cup onion, sliced
4 tablespoons butter or other fat
4 cloves
⅓ cup carrots, diced
1½ cups potato, diced
1 cup strained tomatoes
1 teaspoon sugar
2 teaspoons salt
1½ teaspoons chopped parsley

Use all or any and as many varieties of vegetables as you wish, using half as much vegetable as liquor. Wash, pare, scrape and cut the vegetables fine. Then measure. Mix vegetables, all but the potatoes and tomatoes. Heat the fat in a spider, add the vegetables, cook ten minutes, stirring constantly; add potatoes and cook two minutes longer, then add the boiling water and boil one hour or longer or until all the vegetables are tender, add the parsley, season to taste and serve hot. Any cold boiled vegetable (left overs) may be added to this soup.

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A BRICK ROAD TEST

Eight Hundred Ninety Tons of Commodities and Twenty-Seven Thousand People Transported On Cleveland-Akron Highway in Seventy-Two Hours

Results Shown In Recent Traffic Census, By Maurice B. Greenough, Chief Engineer, National Paving Brick Manufacturers' Association, Cleveland, Ohio

FACTS SPEAK LOUDER than theories or opinions. Engineers who have believed in and advocated the improvement of our trunk highways as affording means for commercial transportation will find assurance and satisfaction in the seventy-two hour census just completed on the Cleveland-Akron Highway at a point ten miles northeast of Akron, Ohio. Beginning at six o'clock on Friday evening, May 18, the census continued day and night until six o'clock in the evening on Monday, the 21st. During this time a total of 9,804 vehicles passed the observation station. Of this number, 507 were commercial trucks of 1½, 3 and 5-ton capacities. Only 191 vehicles were horse-drawn. The balance, 9,106, were passenger motor vehicles.

At this time when railroad facilities for transporting commodities are so inadequate and are causing such a severe strain on our industrial vitality, the greatest interest of engineers centers in the commercial trucks which passed over the road during the census. The actual tonnage of goods transported numbered 890, or 1,780,000 pounds. In terms of freight-car loads this is equivalent to twenty-two 40-ton cars.

Some idea of the importance of commodities shipped may be gathered from the list of those observed during the census.

Among them were: Bar steel, building brick, concrete blocks, farm feed, farm machinery, food-stuffs, fruit, furnaces and furniture. Gasoline, gas tanks, greenhouse products, hardware, lumber and machinery. Merchandise, milk, paving material, sewer pipe, sheet steel, tires, tire rims and window casings.

A modest estimate of the passengers carried by each vehicle would place the number at three. On this basis, a little over 27,000 people were moved over the highway in three days. The ordinary railroad coach carries 150 passengers, and if the estimated number of people observed on the highway were to be transported, 180 cars would be required. Thus, with wholly unorganized means, is demonstrated again the feasibility of through highways for troop movements. With motor cars loaded to capacity, how easily 50,000 troops could be moved, and in how short a time, considering that the concentration of passenger traffic came between the hours of noon and ten at night.

The statement has been made, based upon a careful survey of industrial conditions in the city of Akron, that were the traffic over this road to be shut off, 20,000 men would be thrown out of employment in the industries of the city. The wide variety of important commodities recorded by the census goes far to substantiate this statement.

The Cleveland-Akron Highway is approximately forty miles in length and, with the exception of about three miles, is paved with brick throughout. During the past two years the traffic over the road has been constantly increasing in intensity. In addition to the sporadic traffic which comes to any improved highway, there is a large volume of regularly organized commercial transportation making daily use of the road. In spite of the large figures shown by the census, the capacity of the road is far from being reached.

Summary of Total Traffic, Cleveland-Akron Highway—Seventy-two Hours—May 19-21 Inclusive.

5 Ton Trucks—	
Loaded	96
Empty	45
3 Ton Trucks—	
Loaded	58
Empty	47
1½ Ton Trucks—	
Loaded	96
Empty	136
Over 5 Ton Trucks—	
Loaded	11
Empty	18
Passenger motor vehicles	9,106
Horse Drawn Vehicles—	
Loaded	50
Empty	141
	9,804

Maximum concentration occurred between four and five p. m., Sunday, May 20, when 655 vehicles of all kinds passed.

If these were trucks, each having a 3-ton load, there would be 1,965 tons of commodities each hour. If kept up for twenty-four hours it would amount to 47,160 tons, or 1,179 40-ton freight cars in one day. It is to be noted that the capacity of the road was not reached.

The actual tonnage of commodities moved and observed amounted to 890 tons, or twenty-two 40-ton freight car loads.

PLANT MANAGEMENT.

By Richard B. Hoehne.

Part IV—Poor Machinery Foundations.

THE PRINCIPLES mentioned in the preceding chapter have been neglected in the construction of many a plant. Nevertheless such negligence has been paid, or is being paid, for dearly in form of current repair bills, etc. I found a fair demonstration of this at an Illinois paving brick plant; this incident was partly responsible for the lengthy discussion accorded this subject.

The site carrying said plant originally had been a region of swamps, which fact should have suggested the adoption of some means of building the right kind of foundations, to assure safe supports for the machinery. Instead, carelessness had been permitted to take its course, and the foundations were rested on soft soil, incapable of withstanding the loads. The consequences are by no means hard to detect, namely, lacking rigidity of the foundations renders them insufficient to take up fully the working stresses, hence the foundations as well as the machines they carry shake or vibrate under the stress of operation, whereby the wear and tear is materially increased, but the energy and efficiency badly reduced.

Therewith is presented an occasion where errors are not easily corrected, and it is this kind of mistakes that is well worth avoiding. Would it not require the removal of every machine before the old foundations could be thrown out and replaced by the proper substructures? As this would be a rather costly process, involving greater loss of time than the average business can afford, there is no salvation other than to elevate the degree of efficiency in some other department to offset the inefficiency to be contended with in the operation of the machinery.

Machinery Mounted at Elevated Locations.

A more difficult problem is yet presented by the necessity of placing heavy machinery in elevated locations, as required, for instance, with pug mills, crushers, hoists, etc. In this connection I recall an incident from the same plant, where I found the drive end of a pug mill fluttering somewhat like feathers on a woman's hat when she walks across the Mississippi on the Free Bridge. As feathers are constructed differently and for other purposes, it won't hurt them to flutter, while a similar occurrence identified with a pug mill certainly demonstrates the height of ignorance in plant management.

The pug mill in reference was mounted on a platform about 8 or 9 feet high, constructed of timbers. At the first glance the whole affair did not look much different from the ordinary footings I had frequently seen carrying pug mills. When I got directly to the pug mill, however, I noticed some difference, and, the first thing, I was reaching for the fence, which, of course, was missing. Investigating the cause of the extremely heavy vibration, it became evident that the wooden support was insufficiently braced and anchored, which fault was easily improved upon, though it was impossible to inflict betterment to such a degree as to give the pug mill an ideal footing. While it would be wrong to question the usefulness of lumber in this class of structures, it shall be said that certain circumstances might favor the use of other material, as steel, concrete or "(build with) brick," because the space available in machinery rooms is limited, and not always will conditions permit to apply lateral braces, upon which the rigidity of wooden structures largely depends.

The Cause of Breakage in Machinery.

If a machine, having done service for a quarter of a century or so, breaks down on account of some defective parts, it hardly has a kick coming, and it would be futile to make an attempt at figuring out just what was the cause of its sudden collapse. Anybody knows that iron and steel and most other metals are subject to oxidation, which displays itself in form of rust, and that the strength and function of any machine will diminish in proportion to the effect of "rust eating" upon its metallic constituents.

Now and then it happens that a machine breaks down as a result of unknown defects, which may be hidden within the metal of a certain part. Also, this kind of occurrences are excusable, for the simple reason that such causes are concealed from perception until the metal is broken. It shall be said, however, that defects of this kind will be exposed to sight after breaking has occurred. This statement is intended to invalidate a too common usage of blaming internal defects with a view of concealing the real cause, which close investigation might detect to be carelessness or incompetence on the part of either the operator or constructor of the machine.

This opinion was strengthened but lately by a fair demonstration obtained from an exhaust fan, which was installed on one of the larger plants in this territory for collecting waste heat from cooling kilns for drying purposes. According to information given to me, the fan in reference was designed and constructed by a well-known engineering concern. That sounds good, but one can hardly believe it after taking a look at the appended diagram. Fig. 4 shows the arrangement in general. A 14-foot diameter fan wheel, housed in a brick casing, is mounted on the 5 7/16-inch diameter crankshaft of a 13x16-inch horizontal steam engine running at 100 r.p.m. with 100 pounds of steam pressure.

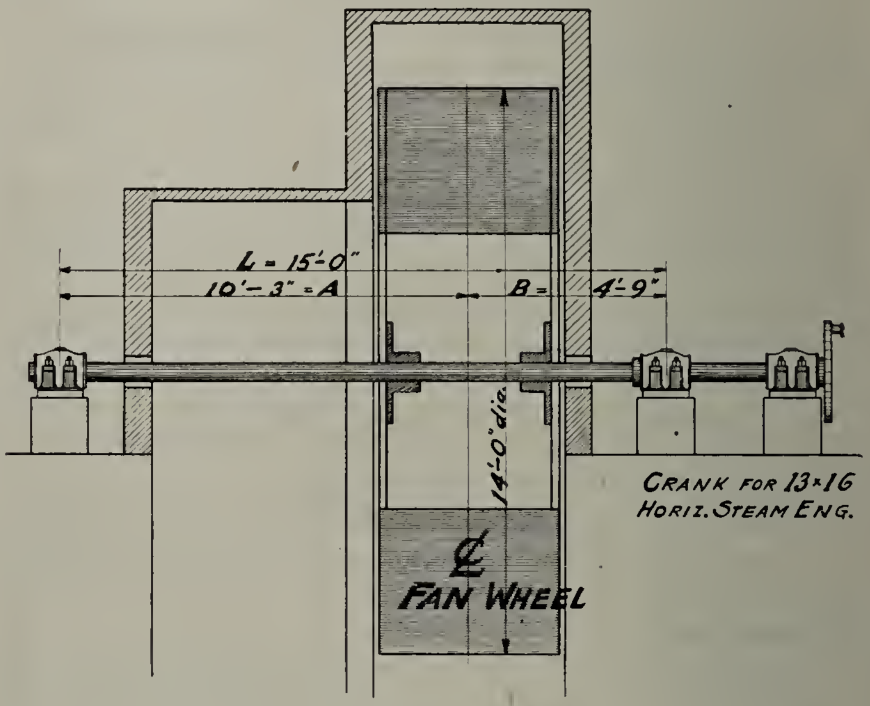


Fig. 4.

The complaint raised about this fan mainly relates to the fact that its shaft breaks approximately every two years. Inasmuch as the shaft seemed to be of sufficient size, the cause of its repeated breaking was laid upon defective material, whereas the succeeding calculation will show beyond doubt that the fault rests with the designer exclusively. As may be seen from the accompanying sketch, the two bearings facing the fan wheel are 15 feet apart; on one side the distance from the center of the wheel to the nearest bearing is 57 inches, while on the opposite side the bearing is within 123 inches. With this impractical arrangement of the bearings, the moment resulting from torque and bending goes considerably beyond permissible limits, thus subjecting the shaft to an undesirable deflection, which promotes upon the fiber of the metal a gnawing action, repeated with every revolution of the shaft.

To begin with, the torque in the shaft shall be determined from the direct connected engine. Thus:

$$\frac{8^2 \text{ x } 3.14 \text{ x } 100 \text{ x } 13 \text{ x } 0.7}{2 \text{ x } 3.14} = 29120 \text{ inch pounds.}$$

To figure the moment of bending (M) at the center line of the fan wheel, it is first necessary to find the impending loads:

$P = 4{,}600$ lbs. = weight of the fan wheel.

$W = 78.95 \times 15 = 1{,}184$ lbs. = weight of the shaft.

$$M = \left\{ P + \frac{W}{2} \right\} x \frac{A \text{ x } B}{L} =$$

$$\left\{ 4600 + 592 \right\} x \frac{123 \text{ x } 57}{180} = 202488 \text{ inch lbs.}$$

The extreme bending (Mt) inflicted upon the shaft is derived from torque and bending moment previously determined, thus:

$$Mt = 202488 \times \left\{ .35 + .65 \sqrt{1 + \left\{ \frac{29120}{202488} \right\}^2} \right\} = 203768 \text{ inch lbs.}$$

According to the customary rules of mechanical engineering, the moment of bending permissible for a shaft of this size is to be determined by the following formula, in which the fiber stress of the metal is taken at 10,000 pounds per square inch. Thus:

$$\text{Mtperm.} = \frac{3.14 \text{ x } d^3}{32} \text{ x } 10000 =$$

$$\frac{3.14 \text{ x } 5.4375^3 \text{ x } 10000}{32} = \underline{158000 \text{ inch pounds.}}$$

By comparing the latter figure with the acting moment, we find the former to be in excess by 45,768 inch pounds; to meet the requirements of safety the extreme moment of bending should be less than 158,000 inch pounds. Consequently, the excessive stress may safely be accepted as cause for the early destruction of the shaft, for which nothing but incompetence on the part of the engineer can be blamed.

(To be continued).

TAXES.

Taxes may be classed as necessary but unpleasant things. Every man recognizes the necessity for taxes to maintain government, and every reasonable man admits that all should pay their fair share of them cheerfully. But there are very few people who take kindly to any new burden of tax, especially when it is direct and easily noticeable. We pay taxes cheerfully so long as they are disguised, and we are not able to recognize easily when and how we are paying them, but when there comes a time like the present and the government gets busy providing ways and means for decidedly increased tax there is always trouble, grumbling and protest, and naturally some errors in judgment on the part of those devising a system of taxation. Also it is when Congress turns loose under the whip of necessity and originates many tax plans that are strongly protested against that we feel thankful for the slow-going, cool-headed conservation of the upper house or Senate, which often saves the day where individual and collective protests of business men are unavailing. The Senate is doing much at this time to help thoughtfully to adjust the burden, and meantime it may be well for all of us who are disposed to complain when the tax proposition hits us in a tender spot to bear in mind that the devising of a painless system of extracting taxes is a difficult problem, and those working upon it have their troubles, too. It is in a way comparable with efforts at painless dentistry. The extracting may be painless to the dentist, and likewise tax systems may be devised that are more or less painless to the devisors thereof, but it is impossible to collect a big sum in taxes without making some people feel that they are pinched. The public has a right, however, to hope that Congress and the Senate will go about this work thoughtfully and with all the intelligence they can bring to bear. On the other hand, it is the duty of every man to make the best of the situation, take up the burden cheerfully and bear his part.

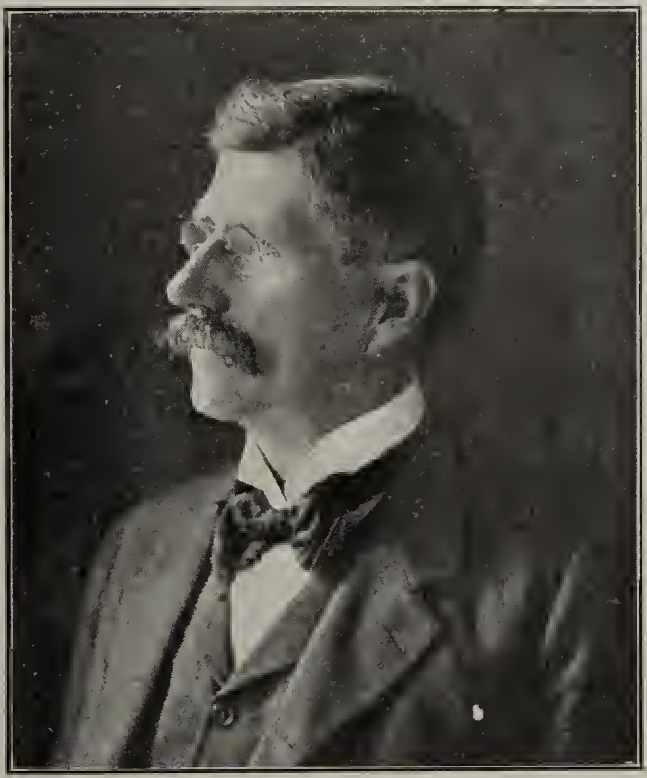
OBITUARY.

DEATH OF CHARLES S. EDGAR, OF METUCHEN, N. J.

We are indebted to Charles A. Bloomfield, of Metuchen, N. J., for the accompanying portrait plate of the late Charles S. Edgar, whose untimely death was due to a fall from a scaffold on his clay property at McIntyre, Ga. Mr. Bloomfield pays the following tribute to his departed friend:

"'In the midst of life we are in death.' Mr. Charles Edgar was in robust health and came from a family that rarely died before well into the eighties, and we all looked for him also to live to a ripe old age. But Tuesday, May 15, while personally superintending the building of a new plant for the production of kaolin at McIntyre, Ga., he had a fall of about fifteen feet, from the effect of which he died the following morning.

"No one was better or more favorably known in the clay business in the United States, and he was the most important factor in the production of kaolin in this country. He had been successful in business life and used his wealth unstintedly to help others. His was a big, noble heart, and no one was allowed to suffer or want if he could relieve them, but he never told of it, and it would never be known but for the fact that the recipients of his generosity told of it. His passing away is a distinct loss, not only to this community, but to the sections where his various plants were located. Twice he was offered the presidency of the New Jersey Clayworkers Association, and both times declined it.



Charles S. Edgar, Metuchen, N. J.

"He would have been sixty-nine years of age, had he lived until September. His funeral took place from his residence in Metuchen, Saturday, May 19."

Now that the garden soldiers of the home guard have taken the exercises in trench digging and seed planting, and have had a share of hoe drills, they can take their final course of training in doing battle against the potato bug with spray guns.

Because the brick man must add more to his prices this year need not cause hesitancy for fear of competition with other building materials, because lumber prices have gone sky high, and brick is really bringing up the tail end of the price increase movement.

SHORTAGE OF LABOR BECOMING MORE ACUTE

Labor Savers in Demand—Dynamite Is Being Used.

THE WORLD TO-DAY is in need of men. Not alone for war purposes, but for business and industrial conditions. Millions of mechanics and laborers are required to run the world's machinery. With all the available men of the fighting European countries enlisted in military services and search being made for volunteers—in fact, a draft law in sight in our country—means are being sought whereby work can be done with less men. In farming and industrial work dynamite is being used as a substitute.

Really, without explosives we would be in a bad predicament. The extent to which high explosives can be used is certainly amazing. They are used practically all over the world for sub-soiling, tree-planting and land-draining.

Fruit growers are high in their praise of dynamite. It prepares the ground for planting orchards so that the roots of the trees may reach far into the loosened earth and thrive properly. Rain sinks into the mellowed subsoil and there serves its nourishing purpose for weeks after the top soil has become dry.

Dynamite is extensively used as a labor saver for digging trenches, canals and ditches. In road building, especially where heavy grades are to be cut down, explosives do the work of many men.

Columns could be written on the employment of explosives for business purposes and its aid to all great constructive work. But, briefly, it is a labor saver when used for the following purposes: In addition to the previously mentioned, draining swamps, blasting holes for telegraph and telephone line poles, straightening streams by blasting new channels, wrecking old buildings, bridge piers and stone walls, blowing down clay in brickyards, breaking up frozen ore on ground or in open cars, and loosening ground for sewer excavations. While this last use may be considered dangerous, it is being accomplished without danger to the public or to underground pipes.

Explosives are known to many only as instruments of destruction, hence their great labor-saving qualities are a revelation.

When the great world conflict stops, the explosives business will not be materially reduced. The world, in peace, will be in a constructive mood and labor-saving dynamite will be used extensively. Besides, millions of acres of European battle fields must be converted into productive farm and fruit fields, and the already great use of this agency for land clearing and draining in this hemisphere will continuously increase.

A Large Blast.

GOING TO MARKET ON THE ROAD OF LEAST REPAIR.

An unusually attractive pamphlet has been published and distributed by the National Paving Brick Manufacturers' Association with the title, "Going to Market on the Road of Least Repair." This has numerous illustrations of brick paved country highways and the constructive work on same fully described in a most entertaining manner.

One illustration shows a farm wagon stuck in the mud, while one in contrast shows a team of horses pulling five wagons, with 319 bushels at 60 pounds each of corn, to market on a brick road north of Newman, Ill. This shows the value of vitrified paving brick in road construction. Where this team could haul five heavily loaded wagons to market on a brick paved road, a single empty wagon would have had difficulty in pulling through the mud holes of an unpaved road. Each and every one of the illustrations are interesting to those studying highway construction.

ANTHONY ITTNER IS HONORED.

WE ARE PLEASED to reproduce from a recent issue of The Censor the following article, which pays a well deserved tribute to our good friend Anthony Ittner, of St. Louis, one of the faithful ex-presidents of the National Brick Manufacturer' Association.

"It is always most pleasing to chronicle the recognition of true worth and service, and never more so than when proper recognition is paid to so eminent a citizen as Mr. Anthony Ittner, of St. Louis. That gentleman, than whom no man is better known or more highly esteemed, has just been notified by wire that he has been elected an honorary member of the National Association of Manufacturers. It is but natural that Mr. Ittner should be pleased with the distinction thus paid, yet in the minds of the many people who know him, the honor is but proper recognition of his sterling qualities. The compliment is no small one, and it is all the more signal from the fact that it comes to the modest gentleman unsolicited if not entirely unexpected. It is certainly most fitting that a man whose long, active career has been so prominently identified with manufacturing should be thus honored by manufacturers. The name of Ittner is and has long been identified with great industries, and especially with manufacturers of an up-to-date and fruitfully constructive character. As the leading manufacturer of brick, Mr. Anthony Ittner may most appropriately be spoken as identified with the material growth of St. Louis for so many years that the minds of men of prominence today run not back to the time when this was not true. Ripe in years and most useful experience, he is no less a factor right now than in the past, and no man is held higher in esteem among his fellow-citizens as a counselor and advisor on the eminently practical things of every-day life, and he is even a stronger factor in the city's progressive and productive forces than in the past.

The organization that has thus signally honored Mr. Ittner is one of the most influential in the United States. The meeting at which Mr. Ittner's election took place was the thirty-first annual gathering, and was held in New York. Mr. Ittner has been a member for nineteen years. The notice to Mr. Ittner came in the shape of a telegram signed by John Kirby, Jr., an ex-president of the body, who was authorized by the organization to send it. In his reply, Mr. Ittner expressed his keen sense of the honor bestowed, and said he felt "more highly honored by the action of the association, and prouder of it than he did of his former membership in the congress of the United States."

SOLVING THE COAL SHORTAGE PROBLEM.

Irving A. Ryttenberg, president of the Sumter Brick Works, Sumter, S. C., is solving his fuel problem in a very satisfactory way, he writes, by installing the Underwood Producer Gas system at their plant. They will be glad to have brickmakers who are interested in this feature of the business pay them a visit and see for themselves what they are doing and how they do it. In a recent letter, Mr. Ryttenberg says:

"We are just getting started, having just burned one section of the kiln without any effort or attempt to make a record, and I feel the kiln has come well within Mr. Underwood's guarantee of fuel consumption. One should see this system in operation to appreciate it, and the best time is to see it under high fire. No smoke, no poking the eyes, no coal to haul and no "niggers" lying around waiting to fire, just two men doing the whole business. Sometimes I feel as if I must put my hand on the kiln to see if it is really burning, or pinch myself to see if I am dreaming. Think of it, water-smoking this clay of ours in a day and a half, where it has always taken from eight to ten. I believe that when we change our style of setting we will cut it still more and the fuel in proportion. Of course, it is going to cramp me some to put out the money at the present time, but the Lord only knows what I would have done without it, and I did not get it in a moment too soon. The labor situation is the same here as everywhere, and everyone knows where the coal has gone. Have not been able to make an exact estimate as yet, but I feel satisfied that we will save more than enough to pay the increased cost of coal, labor and interest on the investment."

Doubtless the Manufacturers Equipment Company, whose ad will be found on page 745, can refer our readers who are remote from Sumter to plants similarly equipped at some nearby point.

PROF. WATTS ACTS AS SECRETARY AND EDITOR FOR THE AMERICAN CERAMIC SOCIETY.

On account of Major Edward Orton, Jr., secretary of the American Ceramic Society, having been called, on May 18, 1917, to active service, it was necessary to appoint some one to act in his place during his absence. According to the rule of the association, a ballot was sent to the board of trustees and this board voted unanimously in favor of appointing Prof. A. S. Watts as secretary pro tem during the absence of Secretary Orton on military duty or until the end of the current fiscal year. Miss M. L. Seymour is to continue as financial clerk, with the title of assistant secretary and with a salary and other arrangements of the office as heretofore. Prof. A. S. Watts was secured as editor for volume 19, and is well fitted for the work.

GEORGE RATHJENS IS CALLED TO THE COLORS.

George Rathjens, of the Twin City Brick Co., a member of the National Brick Manufacturers' Association and a man who has been identified with the brick interests for some years past, has been called to the colors. He held a captain's commission in the Engineer Officers' Reserve Corps and was recently ordered into active service.

SUMMER MEETING CERAMIC SOCIETY POSTPONED.

The summer meeting of the American Ceramic Society has been postponed from week of July 2 to week of July 16, on account of the glass works at Corning and the enameling works at Canandaguia not running Independence week.

This summer trip will include visit to New York State School of Ceramics; Corning Brick, Terra Cotta and Tile Co.; Corning Glass Works (chemical ware); Steuben Glass Works (art ware); Liske Manufacturing Co. (enameled ware); The Pfaulder Co. (enameled ware); Taylor Instrument Co. (pyrometers, etc.), and Pennsylvania Pulverizing Co.

From sightseeing and pleasure standpoint, we will visit the famous Watkins Glen, and sail on Geneva Lake. We disband at Charlotte on Lake Ontario, from which point our members can embark for Canadian Lake ports, or for a trip up the St. Lawrence river and through the Thousand Islands.

Schedule of trip will be sent to members in a few days.

For detailed information, address Ross C. Purdy, Norton Co., Worcester, Mass.

A SPLENDID ISSUE OF "DEPENDABLE HIGHWAYS."

The Dependable Highways for May is worthy of special mention. This clever monthly, issued in the interest of the National Paving Brick Manufacturers' Association, has many interesting illustrated articles of particular value to those studying proper highway construction. The May issue appeals to the reader, both through its patriotic cover and the numerous articles and illustrations setting forth the value of vitrified paving brick in solving the transportation of today.

The feature article is styled "What the Country Highway Means to the Nation," and in this it is shown that road building must proceed with double vigor if we are to correlate all activity in the national service. The illustrations show trucks carrying foodstuffs and supplies over the brick paved country highways to the camps of the constantly growing armies of our country. Other articles of special interest are "Let's Look Squarely at the Transportation Problem," "St. Louis a Large User of Brick, Employs Monolithic Construction," and "Iowa Papers Urge Brick Highways Across State."

A double page plate showing the national highways map of the United States with the transcontinental highways and connecting systems of one hundred thousand miles of national highways proposed by the highways assiciation, Washington, D. C., is particularly interesting. In this connection the Dependable Highways states every mile of road shown on the map is now known only as a black line and can only be traveled by aid of guide posts. They must be brought to a standard of dependability for horse-drawn or gas-driven vehicles, equalling that of a railroad track for railroad cars. Until then no commercial economy, community convenience or personal comfort will be realized by the American people.

Those interested in paving construction can secure copies of Denepdable Highways by writing the National Paving Brick Mfrs. Assn., Engineer's building, Cleveland, Ohio.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T, A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVII. JUNE, 1917. No. 6.

My Country, Right or Wrong—My Country!

CURRENT COMMENT.

Business as usual.

* * *

Be a Bondsman.

* * *

We are wondering how many people will take a war bond instead of taking a vacation trip.

* * *

The indications are that most of the sight-seeing by Americans in Europe this year will be done by the boys in uniform.

* * *

It is becoming plainer every day that eventually the good roadway will be brick paved. Then why not now—in the original making?

* * *

One class of clayworkers, those making furnace fire brick, are exempt from army service. It may be remarked, too, that they are needed in the industry right now.

* * *

The experts of our railroads have very carefully figured out that to move a field army of 80,000 men requires 6,229 cars made up into 366 trains, with as many locomotives. This information helps some, and now if they will just figure out when there will be enough cars and engines working to move coal and other necessaries of life promptly we will feel like they have done something.

* * *

The most popular engraving of the day is the Liberty Bond. It also constitutes one of the safest investments.

* * *

Hoarding foodstuffs for speculation and profit may appeal to some as good business, but it is a bad policy from a humane and national needs viewpoint.

* * *

The right idea of thrift and enterprise is to do things rather than do without things, for it is doing things that keeps the prosperity band wagon going.

* * *

We predict a great harvest ahead for the gold brick men, for when the farmer has surplus money the bunco boys can generally scheme up various successful ways to separate him from it.

* * *

A recent letter from the Department of Commerce tersely interpreted means, when you do get a freight car, load it to maximum capacity, so that it may perform its full measure of service.

* * *

Dealing in billions is big business, and there will perhaps be some muddling before all this big dispensing with money is done with, but in the end we will make good, and, after all, that is the main thing.

* * *

Some of our rich men are showing a commendable order of patriotism these days, proving that with many the love of country is stronger than the love of money, and that patriotism is not by any means an empty word.

* * *

One of the U. S. Geological Survey press bulletins tells us that Utah has set a new record in coal production. Which moves us to remark the coal business has furnished a lot of new records the past year—in high prices—and we hope they will break some of them downward before another winter sets in.

* * *

We are told that one of the necessities of the country is to produce more with less available help in the form of labor, which is but another way of saying something that has been said here repeatedly—that we should bring into commission every form of labor saving devices that is worth while and will give promise of good service.

WALL TILE TESTS.

Making good is a well-known habit of clay products, and this habit is so inseparably a part of the clayworking industry that it is no surprise to us in learning that the tests made of wall tile so far by the U. S. Bureau of Standards are proving very satisfactory. Quite a series of tests are being made to get specific data on various factors involved in wall construction with hollow tile, and the reports are that the tests so far have been very satisfactory in every case, very high loads being obtained and the material showing excellent deportment.

THE CEMENT REPORT.

An advance statement of the final figures of the cement production for 1916 shows a total production of 91,521,198 barrels, which is not the largest production on record, this total having been exceeded by a little more than half a million barrels in 1913. It is a good production, however, and the best thing about it is that the sales and shipments for the year exceeded the production, and better prices were obtainable all around.

The total shipments of cement for the year were 94,552,296 barrels with a value of $100,014,882, which is the highest record for shipment and value.

Higher prices prevailed practically throughout the country in 1916 for cement, and they were needed, for the price had been too low previously. The average factory price per barrel in bulk at the mines was $1.058 compared with 86 cents in 1915, an increase of 23 per cent.

These figures of increased sales and increased prices constitute an object lesson in exploitation that may well be taken home by the brick trade. The cement people put up a splendid fund and have carried on an active campaign of exploitation. The result has been a decided increase in sales and an increase of 23 per cent. in value. That result speaks volumes for the benefits to be derived from exploitation.

GOOD TIME FOR JUGS AND JARS.

This ought to be a great year in the branch of the pottery industry which specializes in jugs, jars and crocks, those familiar containers which for a number of years now have been crowded closely in competition by glass products.

Several things contribute to making this an unusually favorable year for promoting the sale of jugs, jars and crocks of all kinds. In the first place, the glass works of the country are being taxed pretty heavily, and glass has risen in value so much as to put it practically out of the running in competition with the jug where it had invaded the field quite extensively.

That is not all, however, but merely a beginning. There has come about a great scarcity of tin—a scarcity so great in fact that the Department of Commerce at Washington is making a special appeal for the conservation of tin by substituting other materials wherever possible for tin cans and similar containers. This takes in receptacles for putting up food products of all kinds, including preserves and jellies, and many of the things which in the good old days of our fathers and mothers were almost invariably put up in crocks and jars for preserving many of the food products for winter uses. Also there was a using of crocks for butter, and now is a chance for a general return to the good old days of the wide use of crockery. A proper exploitation and selling effort on the part of the manufacturers catering to this line should lead to a wonderful revival and one of the greatest years of production on record in jugs, jars and crocks.

EXPORT FIRE BRICK.

While the fire brick people have been kept so busy the past two years that they have not felt the need for developing export trade, these are conditions which will not always prevail, and we should really have an eye to the future and take a little time off to look into the export trade.

As having direct bearing on this idea there is a consular report of fire clay imported into Argentina, which tells of the fire clay imported into that country during a five-year period, totaling 26,633 metric tons. Of this amount Great Britain supplied 14,934 tons; France, 1,938 tons; Belgium, 1,924 tons; Germany, 1,445 tons; Austria-Hungary, 206 tons; Italy, 138 tons, and the United States, 18 tons.

The total of fire brick imported into Argentina during the same five-year period was a little better than 25,000,000, Great Britain supplying 21,903,000; Germany, 1,430,000; Belgium, 735,000; United States, 720,000, and France, 220,000.

In this case Uncle Sam was not only Jack come last, but it furnishes evidence of two things. One is that our cousins on the other side of the water have been looking after this sort of development much better than we have, and that we have given practically no time to developing trade of this kind. What we have secured has come mainly through supply houses and shippers who have sought out the material and bought it here of their own initiative.

Plainly if we are to occupy the big place we have painted for ourselves in the future, we should give attention to this matter, even if the industry is loaded with work right now. There will come a day when a trade of this kind will be desirable, and we might just as well be laying out our lines to get it. Some of it may be developed through direct connections, but much of it will perhaps be developed through co-operation with machinery exporters, the people who make and sell sugar machinery, baking equipment, lime-burning machinery, metal-working equipment, etc.

PAVED ROADS AS TRAFFIC ARTERIES.

The deplorable breakdown of our railway transportation system and the need for supplementing transportation and conservation in every way serve among other things to impress the importance of all manner of supplementary transportation, including not only our inland water ways, but also as in some respects even more important good roadways. And in the ultimate of this the brick paved roadways.

With brick paved roadways and the motor trucks of the day, we can have a system of supplementary arteries of transportation that will do more than any other one agency to relieve the situation when there is congestion and car shortage among the railroads.

The country is beginning to awaken to this fact now, too, and in time we will have a growth of sentiment crystalizing along this line, which will make imperative the building and maintaining of highways that will stand an enormous commercial traffic—which means eventually brick paved highways.

Facts are already being gathered which speak volumes in this connection, an illustrative instance being that of results shown by a survey of traffic over the Cleveland-Akron highway, by Morris Greenough, chief engineer of the National Paving Brick Manufacturers' Association, of Cleveland. Investigation by him has shown that in a 72-hour period there were 890 tons of commodities and 27,000 people passed over this highway. By and by there will be other surveys of other highways, and if the signs read right in a very short time there will be a general awakening to the possibilities of brick paved highways as a means of relieving traffic congestion, which, together with the other many advantages, should lead to the regarding of these as being one of the imperative needs of the country.

DO THE PEOPLE SCORE?

There is some indication in recent decisions of the Supreme Court pertaining to railway matters and the power of the Interstate Commerce Commission which points to a possibility that the unusual is to happen and the people score against the railroads.

It has been decided that the Interstate Commerce Commission has the authority to order specific distribution of cars, and the decision contains an intimation that there is ground for action on a claim for damages where a shipper has actually suffered because of failure on the part of railroads to supply cars.

If we ever get to the point where shippers can establish claims for damage against railroads for failure to furnish cars there will be something doing in railway circles and an order of service and efficiency never obtainable heretofore. Somehow this sounds like too good a score for the public, to be true.

Meantime, the railroads are putting up a plea for help in the way of a 15 per cent. additional freight rate allowance, and while making some pretense of building new cars and rolling stock are not so far relieving the car situation enough to be noticeable. They are working through unusual conditions, of course, which must be taken into consideration. However, we do not believe that the railroads are entitled to hide all their shortcomings behind unusual conditions. More effort to give service and less persistent wrangling for higher rates will put the railway managers in much better standing in public opinion.

AN ADDITION TO OUR WALL DECORATIONS.

We wish in this manner to acknowledge receipt of a handsomely framed picture of the new plant of the Philadelphia Textile Machinery Company. This is a splendid bird's eye view of their new million-dollar plant at Philadelphia, Pa., wherein the Proctor dryers and drying machinery for all kinds of material are manufactured. This picture occupies a conspicuous place on one of the walls of our sanctum sanctorum.

EX-PRESIDENT DECKMAN TO RETIRE FROM BUSINESS.

Members of the National Brick Manufacturers' Association, National Paving Brick Manufacturers' Association and the many friends of ex-President Deckman will be surprised to learn that on the first of July he is to voluntarily retire from active engagement in the paving brick business. Mr. Deckman writes under date of June 18 that his retirement will take place after thirty years of faithful service in the interests of the industry, and while his interest will remain with the company and the business go on as heretofore, his retirement, which is mutually agreeable to all concerned, will enable him to enjoy more of the fruits of his past efforts.

THE KID HAS GONE TO THE COLORS.

By William Herschell.

The Kid has gone to the Colors
And we don't know what to say;
The Kid we have loved and cuddled
Stepped out for the Flag today.
We thought him a child, a baby,
With never a care at all,
But his country called him man-size
And the Kid has heard the call.

He paused to watch the recruiting,
Where, fired by the fife and drum,
He bowed his head to Old Glory
And thought that it whispered: "Come!"
The Kid, not being a slacker,
Stood forth with patriot-joy
To add his name to the roster—
And God, we're proud of the boy!

The Kid has gone to the Colors;
It seems but a little while
Since he drilled a schoolboy army
In a truly martial style.
But now he's a man, a soldier,
And we lend him listening ear,
For his heart is a heart all loyal,
Unscourged by the curse of fear.

His dad, when he told him, shuddered,
His mother—God bless her!—cried;
Yet, blest with a mother-nature,
She wept with a mother-pride.
But he whose old shoulders straightened
Was Granddad—for memory ran
To years when he, too, a youngster,
Was changed by the Flag to a man.

—INDIANAPOLIS NEWS.

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NEW PROCESS.

For enameled and glazed brick, tile, terra cotta and hollow ware. Also porcelain faced brick, for which there is a large demand.

Automatic and economical process by man of many years' practical experience. One firing; no lead; all colors and artistic effects. Address

BRICK,
6 1 d Care The Clay-Worker.

ROOFING TILES

Earthenware, shingle size. New invention, automatic machinery, reducing cost to compete with wood shingles. Address

J. W. J.,
6 1 d Care The Clay-Worker.

Our government at Washington has been able to get some pretty accurate reports of the activities of our undertakings in the oil industry, but even the government experts can't keep up with the activities of wildcat promotion schemes in oils and minerals which are making more or less successful raids on the money resources of the credulous.

The Federal Trade Commission, after investigating the coal situation suggests remedies under the heads of improvement in transportation, preservation of the labor supply, increase of storage facilities at consuming points, regulation by governmental authority for the distribution of coal. Somehow we had a feeling that improvement in transportation and the labor supply at the coal mines would help out. The question is how are we going to get these?

BUILT RIGHT
RUN RIGHT

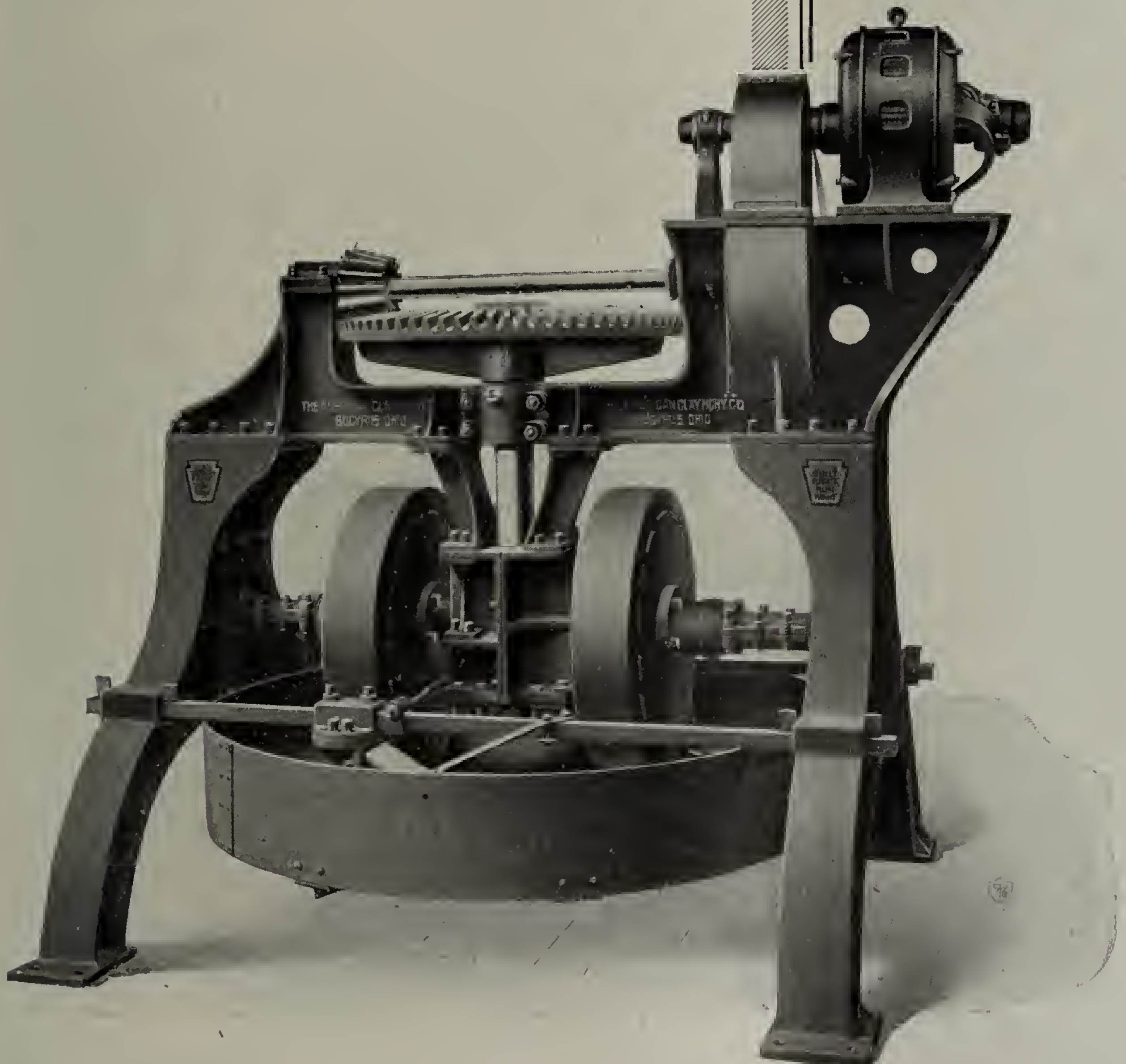
The American Standard Grinding Pan

Economize!

War Time Is Economy Time

The American Dry and Wet Pans will economize for you in many ways.

They will handle more material in less time and on less power.



They are built to save on repairs and are constant workers.

They improve the product and cut the waste.

They are "Built Right and Run Right."

Let us send you our Pan Bulletin telling the whole story.

American Clay Machinery Company
Bucyrus, Ohio

BUILT RIGHT
RUN RIGHT

American Standard Repress

Economize!

War Time is Economy Time

The American Standard No. 292 Repress is a Press for Economy.

It is the cheapest press to buy because it produces perfect block at less cost than other presses.

It is built to operate at higher capacity, on less power, while its handy features of operation materially increase its economy.

It has a minimum of "Out of Order" time. It is built to keep running without repairs.

Ask for our No. 292 Repress Bulletin. It tells it all. We will supply the opinions of other users for the asking.

American Clay Machinery Co.
Bucyrus, Ohio

BUILT RIGHT
RUN RIGHT

American Standard Kiln

Why not save half of your fuel when the Haigh Kiln will save it without cost to you. Saves half the kiln labor, too.

Economize!

War Time is Economy Time

The American Standard Haigh Kiln will win the war of Economy for You.

It costs less to build than the same capacity of other kilns.

It will save one half the fuel ordinarily used in other types of kilns.

It will give a better product and a higher per cent of first grade output.

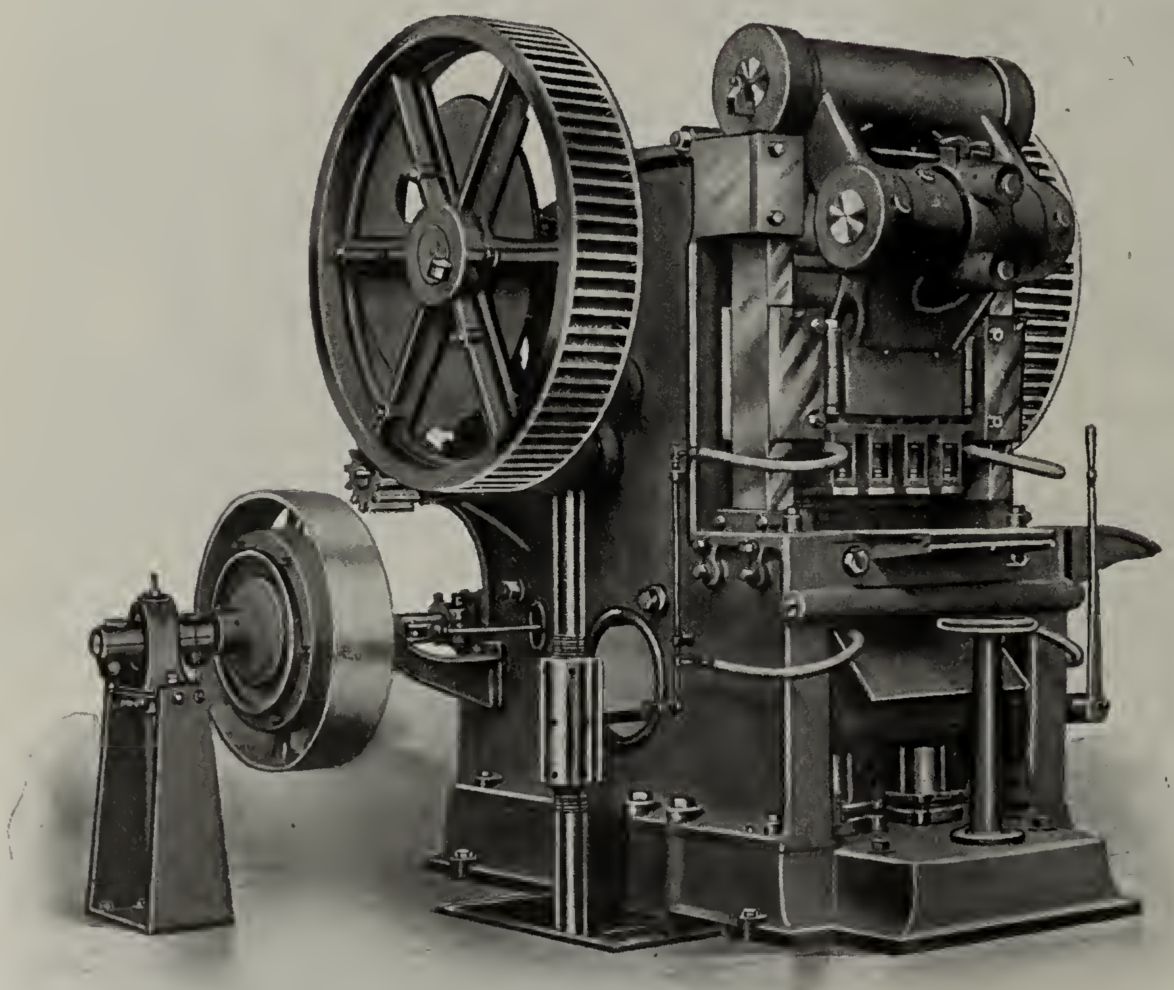
It saves half of the Kiln labor, and the waste heat can be utilized for drying.

Send for the "Economy Story of the Haigh Kiln."

The American Clay Machinery Company,
Bucyrus, Ohio

BUILT RIGHT
RUN RIGHT

The American Standard Dry Press



Economize!

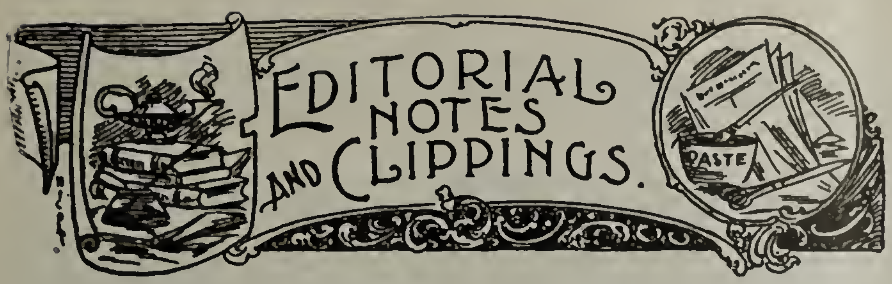
War Time Is Economy Time

The modern design and substantial construction of our line of Dry Press Machinery is an insurance of economical operation.

We build a complete line of machinery and appliances for making Dry Press Brick including power and hand presses, clay steamers, mixers and feeders, sizing machines, buffing machines, barrows, trucks, etc.

To those interested in the manufacture of dry press brick we will be pleased to send our bulletin illustrating and describing the "Built Right Run Right" line.

American Clay Machinery Co.,
Bucyrus,
Ohio



EDITORIAL NOTES AND CLIPPINGS.

T. L. Brown, of Tulsa, Okla., contemplates the erection of a hollow tile plant.

The Kingsport Brick Company, Kingsport, Tenn., has increased its capital stock from $200,000 to $350,000.

The B. V. Brick Co., of Kansas City, Mo., has been incorporated with $150,000 by W. C. Root, George V. Lewis and Walter Brown.

Application for a charter for the New Cumberland Brick Co., of Carlisle, Pa., has been made by C. C. and Joseph Landis, E. S. Herman and F. E. Coover.

The Star Clay Products Co., of Elmdorf, Texas, will build an extensive addition to its brick and tile plant. A. Wagner, of San Antonio, is president of the concern.

H. L. Longnecker has purchased the plant of the Cambridge Brick Co., Cambridge, Md., and will operate same to capacity. He is in the market for a new conveyor.

The name of the Spring Garden Brick Company, of York, Pa., has been changed to the Spring Garden Brick and Clay Products Co., and the capital stock increased from $20,000 to $25,000.

Richard B. Hoehne, of St. Louis, Mo., and John R. Robinson, of Camden, Ark., contemplate the erection of a plant at the latter point for the manufacture of fire brick and other clay products.

One man was killed instantly, and two others injured when the plant of the Great Falls Brick & Tile Company, Great Falls, Mont., was struck by lightning during a storm. No damage was done to property.

One of the plants of the Lehigh Clay Manufacturing Company, of Lehigh, Iowa, has been sold to W. J. Carter, who is acting as agent for a party of gentlemen who will organize a company and put the plant in full operation.

Joseph Bleau has purchased the Retallick brick works at Troy, N. Y. He will enlarge the plant and install modern machinery and appliances. Mr. Bleau was formerly superintendent of the Cary brick plant at Mechanicsville, N. Y.

The Eagle Brick Works, near Mill Hall, Pa., was purchased at a trustees sale by the General Refractories Company, of New York City and Pittsburgh. The new owners will probably equip the plant to manufacture fire brick of a high grade.

A company has been organized to take over the plant now located at Higginsville, Mo., and will operate under the name of the Higginsville Brick Company. The company has a number of orders now on its books and prospects for many more to follow.

The Carlyle Brick Company, of Portsmouth, Ohio, has changed its name to the Carlyle-Labold Company. The company also operates a plant at Sciotoville, Ohio. George E. Carlyle is president and general manager, Simon Labold, vice-president, and Dan W. Conroy, secretary.

At the annual meeting of the stockholders of The Ostrander Fire Brick Company at its offices at Ostrander, N. J., the entire board of directors was re-elected as follows: F. A. Ostrander of Sewaren, N. J., J. W. F. Podmore of Watervliet, and J. K. P. Pine, C. N. Flack and R. Rynders, Jr., of Troy.

The Brimfield Brick Co., of Brimfield, Mass., has recently been incorporated with Herbert L. Fiske as the chief owner. The company has taken over the property of an old established plant at Worcester, and will make extensive improvements in same. Mr. Fiske is president and treasurer of the concern.

The plant of the Ridley Park Brick Company, of Philadelphia, Pa., was almost wholly destroyed by fire June 3, causing a loss of thousands of dollars.

The Green Press Brick Co., of Ferris, Texas, has been incorporated with $30,000 capital stock. The incorporators are W. F. Green, R. R. Green, C. E. Pratt and others.

The Cannelton Clay & Coal Company, of New Galilee, Pa., has been incorporated with $25,000 capital stock. Frank H. Bonnett, of New Brighton, Pa., is the chief stockholder.

The Penn Brick Company, of Bradford, Pa., was recently incorporated with $100,000 capital stock by E. E. Lindemuth, Lewis Emery, A. R. Johnson and J. E. Cochran, of Bradford.

The Ashby Fire Brick Co., of Birmingham, Ala., has been organized with the following officers: President, Herbert Tutwiler; vice-president and treasurer, H. M. Brooks, and secretary, Lee Mackey.

B. Devera, a switchman at the plant of the Barr Clay Co., Streator, Ill., was badly injured in a headon collision of two engines at the brick plant. A mistake in the switch signal threw both trains of empties and the other of loaded coal cars, onto the same track.

Christopher Steadman, the well known Green Ridge, L. I., N. Y., brickmaker, took a three weeks enforced vacation recently when he underwent an operation for appendicitis. He is "back on the job" again as good as new, and we hope will, the next time, have a vacation more to his liking.

Walter McGinnis, of El Dorado, Kan., and Fred Wark, of Toronto, Kan., have purchased a large tract of land at Wichita, Kan., on which they will erect a large brick and tile plant. A company will at once be organized with a capitalization of $100,000 and the work of erecting the plant be started without delay.

The Fallston Fire Clay Co., Oliver Building, Pittsburgh, which formerly manufactured face brick exclusively, now is making fire brick at its Fallston and Eastvale works, both of which are near Beaver, Pa. The company has an annual capacity of about 30,000,000 fire brick. F. P. Cuthbert is general manager of the company.

The Barr Coal, Lumber & Power Co., of Lacon, Ill., will erect a brick plant on their property where they have immense deposits of splendid shale suitable for the manufacture of both brick and tile, according to tests which have been made for them by the E. M. Freese Co., Galion, Ohio. Later on the name of the firm will probably be changed.

The Copeland-Inglis Shale Brick Company, Birmingham, Ala., has become a licensee of the Dunn Wire-Cut Lug Brick Company of Conneaut, Ohio, and will henceforth make wire-cut lug paving brick. This is one of the largest and most important paving brick concerns in the south. Mr. Beattie A. Inglis is vice-president and treasurer, and Mr. W. Lawton Inglis is secretary.

The Banner Clay Works, at Edwardsville, Ill., valued at more than $200,000, has been ordered disposed of at public sale in an order entered in the Circuit Court by Judge J. F. Gillham. At the outbreak of the European war numerous municipalities had paid the company for paving contracts in bonds, which the Banner concern could not sell, and its financial trouble resulted.

The Brick, Terra Cotta & Tile Company of Corning, N. Y., of which Mr. M. E. Gregory is proprietor, has become a licensee of the Dunn Wire-Cut Lug Brick Company of Conneaut, Ohio, and will engage in the manufacture of wire-cut lug paving brick. This company is one of the most important paving brick concerns in that section of the country and it is widely known for the quality of its product and the reliability of its business methods. Mr. Gregory, the proprietor, is one of the leading business men of that section.

The Sparta Tile & Brick Co., of Allegan, Mich., will spend about $40,000 improving and enlarging their plant.

C. C. Frampton, of Grosbeck, Texas, contemplates establishing a brick and tile making plant at Glendive, Mont.

The Star Fire Clay Company has been incorporated by John M. Smith and others of Wellsville, Ohio. The company is capitalized with $25,000.

A serious accident occurred at the Paxtonville brick plant, two miles west of Middleburg, Pa., when a large kiln caved in and six men were seriously injured.

A. P. Green, of the A. P. Green Fire Brick Co., of Mexico, Mo., is at the head of a movement to start another large fire brick plant of 50,000 daily capacity, in Mexico.

At a meeting of the directors of the Pennsylvania Fire Brick Company, Lock Haven, Pa., it was decided to increase the capital stock of the company from $250,000 to $500,000.

William F. Stimmel has sold his brick works at Kutztown to John H. Bieber, who will operate it under the name of the Kutztown Brick Co., and with a capacity of two million brick a year.

There has been no change in the situation at Ft. Dodge, Iowa, as regards the strike in the clay products industries. The plants have now been idle from four to six weeks, due to a demand for recognition by the employers of the clayworkers union.

The Queens Run Fire Brick Co., of Lock Haven, Pa., recently purchased the brick plant and property of the West Branch Brick Works at Drury's Run, Pa. The plant will be continued under its present name, but will be under the management of the Queens Run Fire Brick Co.

The Silver Bow Brick & Tile company, Butte, Mont., recently filed articles of incorporation with the county clerk and recorder. There are five directors, Alfred Paynter, E. G. Schmitt, H. F. Goss, Simon Mettler and Gustav Nickel, all of Butte. The capital stock is $20,000 and divided into 200 shares at $100 a share.

An application for a United States patent on a new form of hollow building brick has been made by Thomas C. McDermott of the Mohawk Valley Brick & Supply Co. In such buildings as are now constructed of hollow tile and veneer, this brick is designed to take the place of these two materials, as it combines the ideas and answers the purposes of both.

The Ashtabula Shale Brick Company, of Ashtabula, Ohio, has been taken over by the R. L. Dollings Company and will be operated in the future under the name of the Lake Shore Shale Brick Co. R. C. Burton, of Zanesville, is president of the new company, and W. H. Luchtenberg, formerly general manager of the Hocking Valley Brick Company, will be general manager of the plant.

The Brookhaven Pressed Brick Co., Brookhaven, Miss., has reorganized and is under full operation getting out the material for several new contracts, the largest being for the government post offices at McComb City, Miss., and Hammond, La., and a government contract at New Orleans. The new organization is composed of Ferd Becker, manager; Jap Phillips, superintendent, and Sam Abrams, J. W. McGrath and L. H. Bowen, active directors.

A syndicate composed of Howard T. Janney, James B. Graham and Murray C. Leinbach, of Williamsport, Pa.; James H. Allport, of Barnesboro, and J. M. McKinley, of Curwesville, Pa., has just purchased and taken over the Geo. S. Good Fire Brick Co., operating at Lumber City, for $360,000. New officers are Howard T. Janney, president; James H. Allport, vice-president; James B. Graham, secretary and treasurer; J. M. McKinley, general manager, and Murray C. Leinbach, general sales manager. Plant of the company is to be greatly improved.

Baxter Greenoble, of McClellansville, S. C., will establish a brick plant at Charleston, W. Va.

George D. Sanders contemplates installing a plant at Fairfax, S. C., for the manufacture of brick and tile.

The barn of the American Brick Company at Berlin, Conn., was destroyed by fire recently, causing a loss of $800.

The Laclede-Christy Company has been incorporated in the state of Pennsylvania, with $150,000 capital stock, and will locate a plant at Rochester, Pa.

The Saginaw Paving Brick Company has resumed active manufacturing operations at its plant, about fifty men being employed at the Saginaw yards and at the pit in Flushing.

At a meeting of the Executive Committe of New Jersey Clay Workers' Association, held Saturday, May 26, Mr. Howard Valentine tendered his resignation as president owing to continued ill health, and Mr. August Staudt, President of Perth Amboy Tile Company was elected to fill the vacancy.

The work of installing the brickmaking equipment at the penitentiary at McAlester, Okla., is progressing rapidly. The machinery was purchased from the American Clay Machinery Company, Bucyrus, Ohio. The brick turned out at this plant will be used in the construction of state buildings.

Work has been begun in earnest on the plant of the Staunton Clay Products Co., Staunton, Va., and it is expected to have the plant ready for operation in twenty days. L. R. Cunningham is president of the company, C. H. Forry, vice-president and manager, and J. W. Blackburn, treasurer. The company has been capitalized at $300,000.

The Imperial Porcelain Company, Trenton, N. J., has organized a subsidiary company to be known as the Newton Porcelain Works. The former plant of the Newton China Company of Newton has been acquired and will be used for the manufacture of electric porcelain specialties, and operated as an auxiliary to the main plant at Trenton.

The Metropolitan Brick Co. will build a large two story office building at its Youngstown, Ohio, plant. The new office building which will be modern throughout, will contain club rooms for the office employes, lunch room, shower bath, lockers and other conveniences. The need of a larger building for the office force has become necessary as the brick plant has been expanding.

A VITAL QUESTION ANSWERED CORRECTLY.

Always up to date W. E. Dunwody, the live-wire brickmaker of Macon, Ga., is calling to the attention of prospective builders of that section the importance of avoiding the calamity which recently overtook Atlanta, by building unburnable brick homes. The following is the gist of the letter he has recently mailed to his patrons:

"The smoking ruins of the buildings recently visited by the disastrous fire in Atlanta, prove to everyone that every man should protect himself and his family against the fire that will probably come to him sometime during his lifetime. The answer is

"BRICK."

"Many brick chimneys standing as lonely sentinels, all that remain of once beautiful homes, give mute but startling and convincing testimony of the everlasting and fire-resisting qualities of brick.

"The establishment, in Georgia, of Military Training Camps must necessarily increase business in every line in our state. Increase in volume of business will make necessary more buildings. Do not make a mistake:

BUILD WITH BRICK

Grand Ave., Beloit, Wis., Brick Pavement Filled with Barrett's Paving Pitch

Barrett's PAVING PITCH

Why Pitch is the Practical Filler

THERE are so many little things to look out for in a paving contract that the most practical method is the one that cuts out the most danger-points altogether.

In the matter of a filler for brick, granite or wood block—

—*If you use cement filler*, you must study the matter of expansion-joints and do some clever guessing, and as there is no exact science of expansion joints, you are due to guess wrong once in a while. Then your pavement cracks from contraction or "explodes" from expansion, or thrusts the curb all awry, or breaks off the top of a manhole! You must also watch minutely the installation of the cement filler, for the omission of a little spot here and there means frost in your foundation.

—*If you use asphalt filler*, you must take precautions against using it at too low a heat. It cools rapidly and it is lively work using it to get best results because it chills on contact with the brick and refuses to adhere. When cold weather comes, the asphalt will probably let go of the brick anyway and admit water and frost.

But if you use pitch you don't have to look out for anything, except to be sure it is a real paving-pitch and not a local tar or hard roofing-pitch.

There will be no expansion-joints and no expansion problem—"*Every joint is an expansion-joint.*" It maintains a tight, flexible seal through winter and summer, and when after twenty or thirty years the bricks wear out the pitch will still be there and as good as new, unaffected physically or chemically by its long service.

The standard pitch is Barrett's Paving Pitch. Look for the label on the barrels.

Booklets free on request. Address our nearest office.

The Barrett Company

TRADE B MARK

New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
Detroit Birmingham Kansas City Minneapolis Nashville Salt Lake City Seattle Peoria
THE PATERSON MFG. CO., Limited: Montreal Toronto Winnipeg Vancouver St. John, N. B.
Halifax, N. S. Sydney, N. S.

GENERAL OPERATIONS IN THE EAST.

ALL OVER THE western part of the country the kilns are burning, and deliveries of the new season's brick has begun. It is a little late in some localities because the stormy weather hampered operations. Yards have suffered from the almost continuous rain and have been forced to slow up because the weather was so bad. But this seems to be over and the situation has improved to that extent.

Along the Hudson river, operations are somewhat restricted because of the difficulty of securing labor. That labor is scarce is shown in many ways, and that it will be no more plentiful is also shown in various ways. If the draft comes immediately business will be seriously disrupted at the opening of the season. But perhaps it may be as well to have it over with and the uncertainty settled early rather than late. It is one of those things that must be, and the sooner the business man knows where he stands and upon what he can depend the sooner the work will settle down to regular activity.

Some of the yards along the Hudson have not been opened, some are operating only to partial capacity, while still others are running full and are preparing the usual quantity for burning.

In the Hackensack district much the same conditions prevail. Labor is scarce and makers are having difficulties to get men. Some of the yards are not yet opened, while others have their second kilns laid up. Those who are at work are getting out as much brick as they can.

In the Raritan section conditions are similar. Business has opened with only a part of the summer yards operating to capacity. The failure to do so is largely because it is almost impossible to secure help. But those who are supplied are working rapidly and hope to take advantage of such favorable opportunities as may develop in the future. They have known that labor is going to be scarce, so it is not unexpected, but perhaps some of them are suffering more than they expected.

In New England manufacturers are endeavoring to secure sufficient help to keep their output up to normal, but they are finding it very uphill work. In Connecticut they compete with munitions factories, and the same thing applies to some extent in Massachusetts. This drawing power is less in New Hampshire, and Maine and Vermont are free from it, at least in the sense that Connecticut suffers. In some parts of New Hampshire factories are calling for help, and they succeed in enticing some away from the yards, and the same thing is true in some parts of Massachusetts; but this is a much less serious menace to the business than munitions factories. The pay is so high in the latter and they can utilize unskilled mechanical labor at such profitable prices that it is small wonder brickyards suffer.

Demand and Prices.

About New York common brick are held at $10.00, and sometimes on large orders this figure can be shaded a bit. Sales have been made as low as $9.25, but this was for the purpose of holding trade. In nearly all instances $10.00 prevails.

Over in New Jersey the same figure is paid. At the Newark docks $10.00 seems to be the ruling price. It is the same in Jersey City and in Paterson, the other two large cities of the state.

Raritan makers are getting the same money. A few of them make selections and get a little more, but these figures are rather a matter of negotiation than regular prices.

Demand is sufficient at the moment in all quarters to absorb everything that arrives. Receivers in New York are assisting to conserve the supply so that prices will not soar to prohibitive heights. Some see in the possibility of steel being commandeered for building ships a rather larger opportunity for brick. But if any larger one schould develop it is difficult to understand what can be done with it. Dealers have hard work to secure the brick they order now.

Shortage of freight cars is one reason. One large dealer was told that he could have five cars a week, which was about half of what he is obligated to deliver, and probably others are in similar tight places because the government must have freight trains to haul goods for the army and navy.

Building operations all through the East are good, though they are not what was expected by some of the more sanguine. Still, the outlook is quite as good as the possibility of getting transportation facilities to deliver what is bought.

BURTON.

THE COAL SITUATION.

Conditions in the matter of coal supply and prices get a little better now and then and at times get worse again. And it is all so confusing that even the best of authorities refuse to make predictions.

At first we were told that it was purely a matter of car supply to get more coal and cheaper coal, but now we are learning that there is a great scarcity of help in the coal mines, and it is doubtful if the production could be materially increased even if more cars were available. Moreover the cost of production has increased almost 50 per cent. compared to last year, consequently there is no chance for coal to go back to the old level soon.

There are two influences operating to relieve the situation and bring prices down from the higher notches. One of these is the general appeal for and a tendency toward economy in coal consumption. Not only will the industries themselves seek for the greatest efficiency through the most up-to-date appliances for using coal, but they will seek to reduce the needs as low as possible, and at the same time in the homes the uses of domestic coal, if present prices continue, will be reduced anywhere from 25 to 50 per cent. All of which will tend to lessen the consumption and relieve the tension.

The other influence toward relieving the situation comes from new enterprises. These are illustrative of the fact that in a way high prices bring their own best remedy, because they tend to restrict consumption on the one hand and to increase production on the other. New coal operating concerns are being organized every day, and millions of dollars are pouring into coal mine development right along now, which in time will have its effect. The time is retarded somewhat by the difficulties of securing material and equipment for starting these new operations. This makes the progress very slow, but they are making progress, and in the course of time we may expect not merely a relieving of the present shortage in coal, but quite a flood of surplus coal in the country.

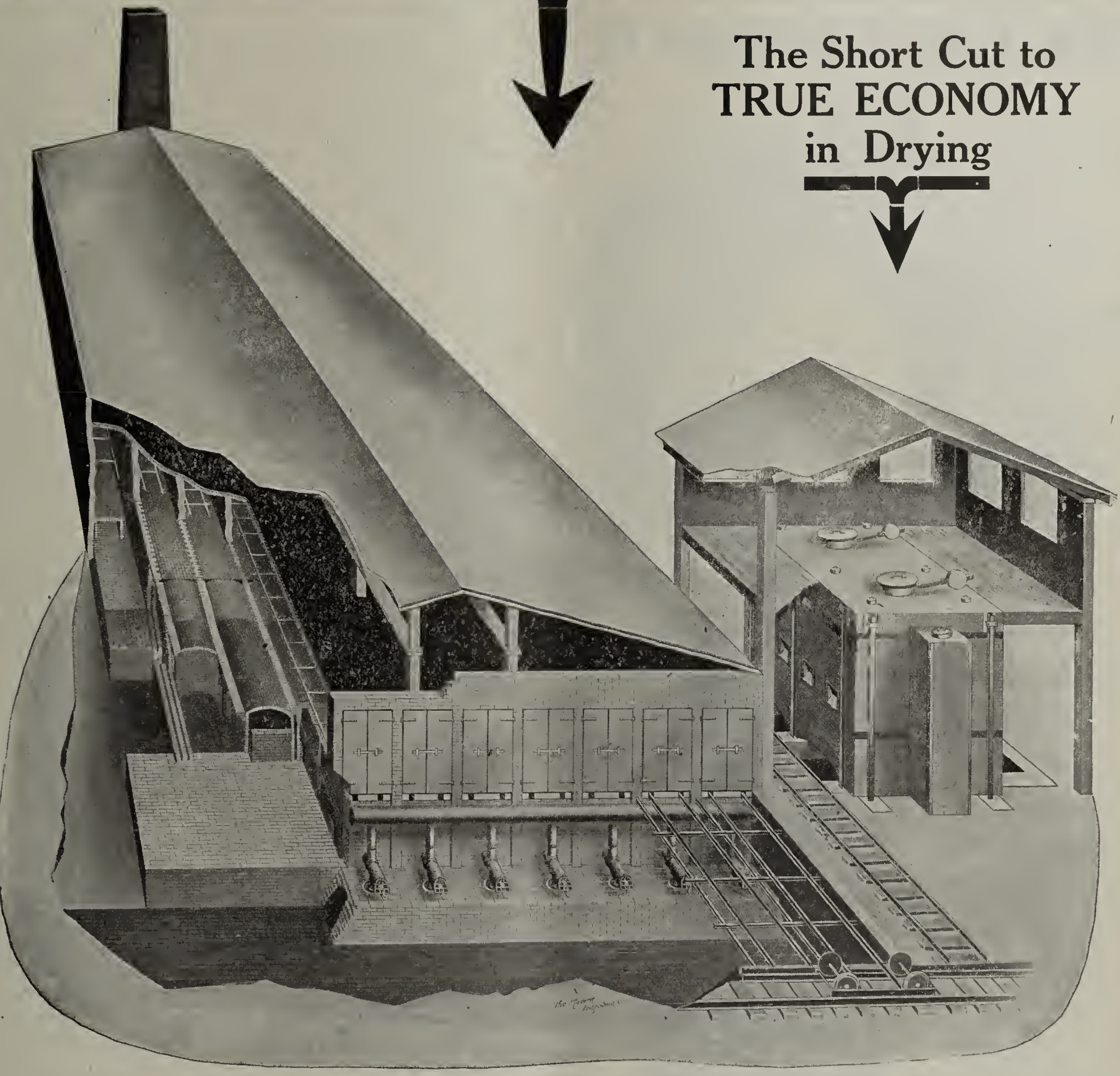
Meantime, the coal consumer, while he may look hopefully for some easing up in prices and a better supply, need hardly expect the low prices of last summer, because the cost has increased all around. The only safe basis to figure on is that coal will cost considerably more this year than it did last year.

We are not always in accord with the arguments of the lumber folks, but we heartily join them in arguing for better control of railroads and car movements, so that we can have better shipping facilities of lumber, brick and other building material.

We can understand and sympathize more or less with the cranks who want to tell the government and everybody else how to do things, but we have no patience whatever with those near-traitorous people who would block registration and hamper the government in its efforts. Even though we may not always agree with the specific line of action undertaken, it is the duty of every man to give assistance and in no way hinder his government.

MECO PRODUCER GAS FIRED DRYER

The Short Cut to TRUE ECONOMY in Drying



It saves fuel and labor—both very important factors in brickyard operation today, and it can be applied to any type of direct heat dryer at a surprisingly low cost.

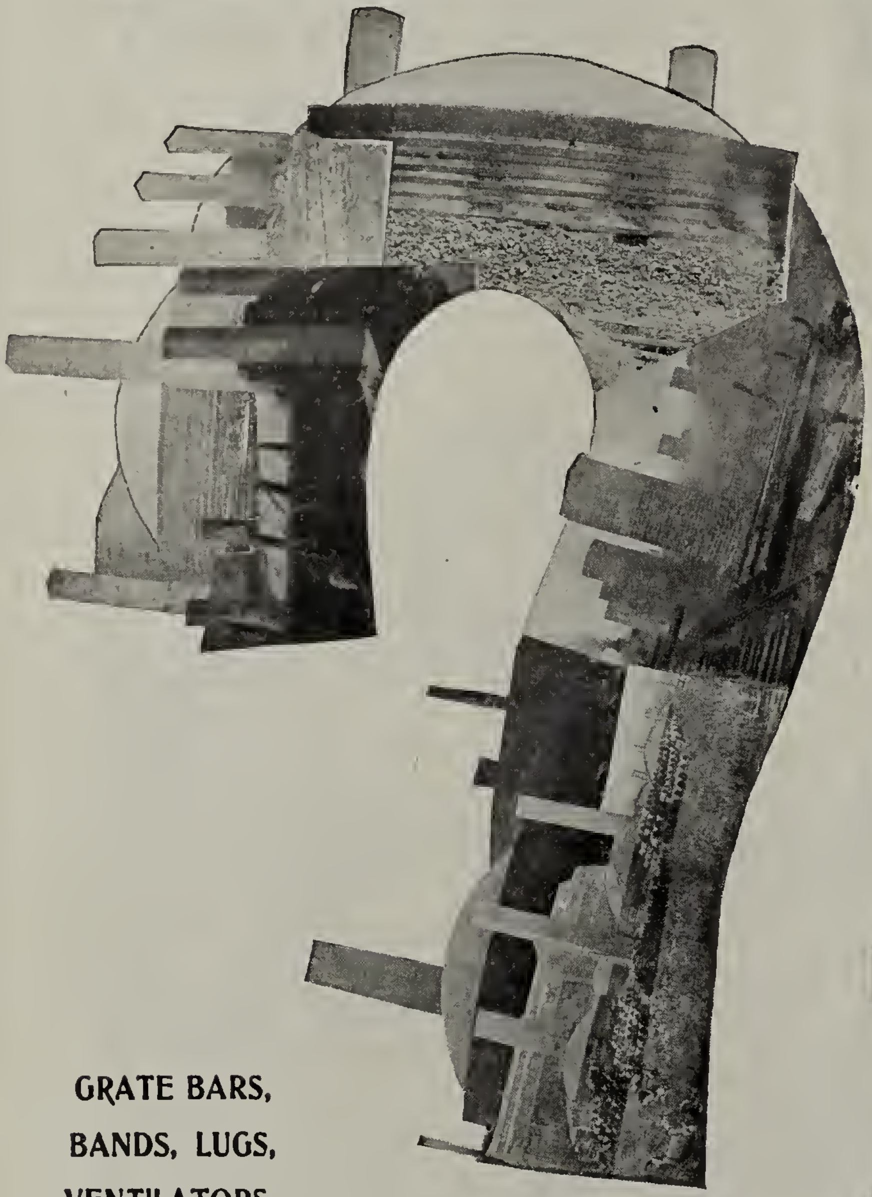
The illustration above gives a general idea of the simplicity and compactness of the system when done the "MECO" way, and which is particularly efficient because *we know how it should be done.* Our thoroughly organized and highly proficient engineering department is at your service for further details.

The Manufacturers Equipment Co.

Dayton, Ohio, U. S. A.

Geo. H. Smith, Western Agent, 507 Reliance Bldg., Kansas City, Mo.

If Its a Question of KILNS We Can Answer It



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VENTILATORS,
CASTINGS

Equally efficient in round, square or rectangular kilns, single or multiple stack type. New Hook Kilns cost less, as a rule, than kilns of other styles. Old kilns can be changed to our type at comparatively small expense. Give us number and size of your kilns, kind of ware, burning time and fuel consumption. We will estimate cost of installation and saving that can be effected.

HOOK PATENT KILN CO.
High and Spring Streets
COLUMBUS, OHIO

Written for The Clay-Worker.

BRICK NEWS FROM THE TWIN CITIES AND THE NORTHWEST.

BUILDING in the Northwest has seen a decline from a year ago, as well as something of a slump from two years ago. The cause for it, so far as any one cause may be assigned, is that the advanced prices of materials have not been accepted by owners as likely to last. Project after project has been figured, and the prices have run so much more than the estimates that the work was deferred. In this, the advance has been principally upon iron and steel, both structural and in the mechanical equipment. Heating material and plumbing show an advance of far more than brick, tile and other similar materials. The result has been to throw the relation between the cost of the structure and that of the mechanical equipment, sadly out of line, to the discomfiture of intending builders. In this respect, brick has been one of the items showing the least advance, if indeed on many items in brick there has been any increase. And it is not because there is not just cause, for coal has advanced sharply, oils are higher, equipment is higher, and every item seems to be higher.

The government is spending vast amounts in its cantonments at various military forts, but the work is largely of frame construction and temporary, so that it does not benefit the brick trade to any extent. The brick trade will get its share later on, for there will surely be permanent construction required in connection with some of the later construction.

Brick prices are not as high as they should be. This is especially true of face brick, where the competition has resulted in many holding back on advances which they should make, awaiting the first move by a competitor. On common brick the local situations have ruled. Where the supply was pretty well exhausted, the brickmaker who did not advance his price for the limited supply that he had remaining, showed himself to be a poor business man. Gradual advances have been made on brick, with the word that coal is to cost twice as much as last year, and that other items are also higher. The belated season, and the long backward spring with danger of frost, have cut down the season, so that with even a reasonable demand for brick, there is likely to be a shortage for the season. All this means higher prices, and the wise brickmakers have been able to see this and to make their prices accordingly.

The recent organization of the Northwest Face Brick Association has had good effect already in removing some of the trade abuses which have grown up in the business. There remains much still to be accomplished, but it is felt that there is an excellent start made, and the members are much encouraged that the future has much of promise, as a result of the organization.

The war has caused some interference with business, as organizations are affected by the recruiting and draft. In the Twin Cities a number of brick concerns have lost men from their organization.

J. K. Hanchett, salesman for the Colburn Brick & Tile Company, of Minneapolis, has enlisted in the navy, and has left for the east to take up his new duties.

T. J. Murray, a well known brick salesman of Minneapolis, is now representing the Northwestern Terra Cotta Co., of Chicago, in the Northwest. He has offices on the fourth floor of the First National-Soo Line building.

The Minneapolis Builders' Exchange has awarded the contract for the erection of a handsome office building to the H. N. Leighton Company, of Minneapolis. The building will be twelve stories high, brick and terra cotta construction. The builders felt that they could show the faith they have in the stability of present prices by proceeding with the erection of the proposed structure. It overran the estimate somewhat, somewhere about 14 per cent., but the organization has finally announced the award of the contract for the full sized building. When completed, it will afford offices for building material dealers of every kind. It is understood that several brick concerns have leased good sized space for offices and exhibits. The work is to be pushed to completion as rapidly as possible, and it is figured that it can be accomplished in about nine months.

T. WIN.

WEDS ERE HE GOES TO WAR.

The many friends of A. R. Root, Philadelphia, Pa., and they are many, will be interested to know that his son, Stanley W. Root, is soon to be married to Miss Henrietta Elizabeth Brown, of Chestnut Hill. The bridegroom is a valuable acquisition to Uncle Sam's fighting forces, being a member of the Second Field Artillery of Pennsylvania. During his college days he was noted for his prowess as an athlete.

BACK TO CHICAGO.

As the readers of The Clay-Worker will see by the ad of the L. E. Rodgers Engineering Company on page 673 of this issue, the main office of that firm is again located in the Stock Exchange Building, 30 North La Salle street, Chicago, where visiting clayworkers will be welcomed cordially and exceptional facilities afforded those desiring information relative to drying and burning clay wares.

TO THE PRESIDENT.

By John Kendrick Bangs, '83, in "Columbia Rambler."

We have fought you Mr. Wilson, just as hard as e'er we could;
We have lined our pens against you, and we've told you where we stood;
We have criticized your actions, and we've tied a lot of hay
For to trip you, and to grip you, as you've run along your way;
We've opposed your re-election, and we've jested now and then
On the subject of your doings and the products of your pen;
But we want to tell you now, sir, in this moment full of dole,
We are with you—yes, we're with you! We are with you heart and soul!

And the past, sir, is forgotten, just as though it hadn't been—
Just as 'twere a bit of writing on a slate washed wholly clean;
All the things we deprecated, all the things we didn't like.
They have vanished from our vision like a pacifist on strike;
All remembrance of your "waiting" and its brother "watchfulness"
Has gone tumbling to the discard in this moment of your stress;
And we want to tell you now, sir, when you come to call the roll,
You will find that we are with you—yes, we're with you heart and soul!

There's no Elephant or Donkey on the Yankee pike today,
And the Bull Moose stops his bulling on the broad and starry way;
All the animals of party in our over-varied zoo
Are united, Mr. Wilson, and are standing back of you;
From the sands of San Diego to the rocky cliffs of Maine,
From Atlantic to Pacific, out and back and back again;
So here's to you, Prexy Wilson, may God speed you to the goal!
We are with you—yes, we're with you! We are with you heart and soul!

"On-the-Job"
Gandy's
10th Show-Down

TWENTY-SEVEN YEARS
IN A BRICK-YARD

"Whew-ew-ew, some old belt that, and ready for the scrap heap."

"But not so fast," says "On-the-Job" GANDY.

"After making a hundred and forty million bricks in twenty-seven years, I get my second wind and a chance to show you how good I really am.

"Twenty-seven long years of steady run, run, run, in winter's snow and sleet, in pouring rain and sizzling heat, through streams of steam and acid fumes, in dripping oil and flying grit.

"How do I do it?

"I am the product of scientific investigation — quality materials and workmanship — of curing and seasoning processes that pep me up with a never-slack, never-slip, never-stretch, stick-to-it-or-bust spirit.

"I'm "On-the-Job" GANDY—the original stitched Cotton Duck Belt, and the service I'm rendering thousands of industrial plants, fertilizer works, textile mills and machine shops, I will render you. Order me from your supply house TODAY, but be sure you get GANDY."

*Write for samples
and prices.*

The
GANDY
BELTING
CO.
749 West Pratt St.
Baltimore, Md.
U. S. A.

*New York Branch
36 Warren St.*

Stand Behind the Men Behind the Guns

Buy

A Liberty Loan Bond

and

HELP WIN THE WAR

Interest 3½%

Issued by the UNITED STATES GOVERNMENT

Denominations—$50, $100, $500, $1,000, $5,000, $10,000, $50,000, $100,000

First payment as low as one dollar. You have until August 30, 1917 to pay in full for your bonds. ASK ANY BANKER, POSTMASTER, EXPRESS COMPANY OR MERCHANT for an Official Application Blank and

Apply for Your Liberty Loan Bond Today

A TRIBUTE TO THE FLAG and the SAFEST INVESTMENT IN THE WORLD

"Wars cannot be conducted without money. It is the first thing to be provided. In this war it is the most immediate help—the most effective help that we can give. We must not be content with a subscription of two billion dollars—we must over subscribe this loan as an indication that America is stirred to the depths and aroused to the summit of her greatness in the cause of freedom. Let us not endanger success by complacent optimism. Let us not satisfy ourselves with the reflection that someone else will subscribe the required amount. Let every man and woman in the land make it his or her business to subscribe to the Liberty Loan immediately, and if they cannot subscribe themselves, let them induce some one else to subscribe. Provide the government with the funds indispensably needed for the conduct of the war and give notice to the enemies of the United States that we have billions to sacrifice in the cause of Liberty.

Buy a Liberty Bond today; do not put it off until tomorrow. Every dollar provided quickly and expended wisely will shorten the war and save human life."

Secretary W. G. McADOO,
May 14, 1917.

A Liberty Loan Bond is Uncle Sam's Promise to Pay and He is Worth $225,000,000,000.

Publicity Bureau Liberty Loan of 1917
R. W. Woolley, Director, Room 181,
United States Treasury Building
Washington, D. C.

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ORIGINAL Boss SYSTEM **Drying and Burning** ORIGINAL Boss SYSTEM

BOSS TEN-HOUR DRYER

Use either waste heat or exhaust steam.
No live steam. No direct firing.

BOSS SYSTEM OF BURNING BRICK

Applies to all types of kilns and will save HALF in your cost of burning.

Let us save Time and Money for you

ORIGINAL Boss SYSTEM **JOHN C. BOSS CO.** ORIGINAL Boss SYSTEM
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for strength, durability and constant satisfaction because all Caldwell Towers and Tanks are built on scientific principles by men who know.

A Caldwell Tubular Tower is shown here.

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We can save you 25% of your fuel bill. No money until we do it. Don't you think this worth a stamp?

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X. L. KILN & DRYER CO.
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YOU HAVE KNOWN FOR YEARS THAT
RICKETSON'S MORTAR COLORS
are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.
Red, Brown, Buff, Purple and Black.
RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

CLAY NOTES FROM DIXIELAND.

The FULCHER BRICK CO., of Nashville, Tenn., was the fortunate party in getting the contract for the brick for the Belle Meade brick apartments at Nashville. They also have the contract for the brick for the Castle Heights School at Lebanon, Tenn.

Building prospects at Nashville and Memphis are reasonably good, despite the war times. A wonderful amount of remodeling is going on in both cities, several large structures are being finished and some needed residences and public buildings will go up this summer, and the plans have been drawn or the contracts let.

A real city market and auditorium is being promulgated by the city of Memphis, and it seems may be fully planned before the year is out. A new modern theater somewhere on Main street, built by the Loew vaudeville interests of New York, is said to have been designed by New York architects. For the present the site has not been made public.

Architect W. C. Lester, of Memphis, has drawn plans for a warehouse and garage at Marianna, Ark., to cost $10,000.

J. G. Falls, owner of the Clarendon Hotel property, Madison avenue, Memphis, is contemplating the erection of a brick store and office building of modern design on the site of this once very popular hotel, in days past the rendezvous for theatrical, race horse and business people who visited Memphis in the palmy days.

Architects Favrot and Livaudais, of New Orleans, will be the architects of the new Leland University $100,000 buildings to be erected at Alexandria, La. The board of the institution, which is for the education of negroes, has purchased a 257-acre tract at the edge of Alexandria.

Ernest Lee Jahncke was re-elected president of the Association of Commerce at New Orleans at the May meeting. Mr. Jahncke is well known in building trade circles.

The Indianola Brick and Tile Co., at Indianola, Miss., has arranged for active operations again.

The Johnson-Porter Clay Co., of Carroll and Henry counties, Tenn., operating near McKenzie, Tenn., and Paris, Tenn., are working their mines every day and make shipments as fast as car service will permit.

The Nashville Pottery Co., of Nashville, Tenn., W. H. Quarrels, secretary, reports satisfactory spring business. This season Mr. Quarrels himself made a trip through the southeastern territory and landed orders for twenty-five solid car loads of product.

The Bullard Brick Co., of Jackson, Miss., R. W. Bullard, manager, is enjoying a good trade in Mississippi's capital city and neighboring section, wholesale and retail.

W. B. Taylor, of Jackson, Miss., is another brick dealer in central Mississippi. He uses a trade slogan like this: "Brick, not better than the rest, but better than the best."

C. Sparks & Sons, at McKenzie, Tenn., have been making some improvements in their pottery, and report trade satisfactory. They have some valuable clay properties and turn out a varied and extensive line of hand and machine made goods in jars, vases, jugs, tile, crockery, etc.

The old firm of John A. Denie & Sons, Memphis, has taken over the Tri-State Builders Supply Co. and the Moss-DeVoy Co., a more recent firm, and all three are operated now as one under the name of John A. Denie & Sons, with principal office on South Front street and several branch yards. All the firms carried and the consolidated firm will carry an extensive line of fire brick, clay products, sewer pipe, etc.

Allen Tupper, of New Orleans, is one of the veteran dealers of the Crescent City. He handles retail and car loads of building material and gives special attention to fire brick, fire clay, fire clay flue pipe, chimney tops, hollow wall partitions, etc. He has been active in the new Orleans building trade circles since 1886.

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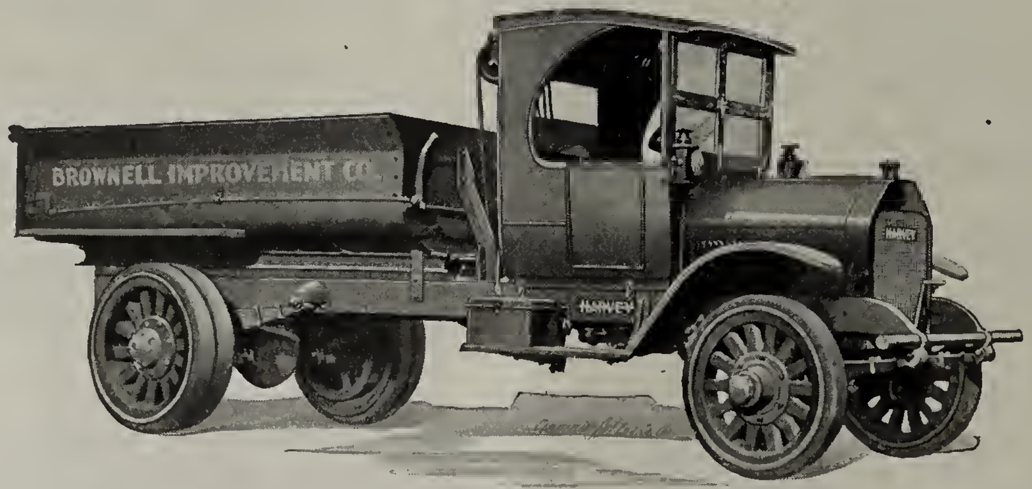
HARVEY TRUCKS

The Repeat Order Truck

ALL
UNITS
OVER
SIZE

SIZES
2½ Ton
3½ Ton
5 Ton



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HARVEY, ILL., (Chicago Suburb)

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CHICAGO.

Mention The Clay-Worker.

Engineering Lib

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

Vol LXVIII. INDIANAPOLIS, IND., JULY, 1917. No. 1

Written for THE CLAY-WORKER.

OLD GLORY IN BRICK

THE SPIRIT OF PATRIOTISM is rife in the land and finds forceful expression on every hand and in various ways, both in public and private life. Old Glory is more loved and appreciated today the world over than ever before. We are pleased to present to our readers an evidence of this universal love and admiration for Old Glory by the reprint on our cover page of Old Glory in brick. In this form everlasting the flag greets the eye of the visitor to the office of the Chicago Hydraulic Press Brick Company in the Chamber of Commerce Building, where for the first time in the Nation's history our flag is reproduced in undying clay.

YOUR FLAG AND MY FLAG.

WILBUR D. NESBIT.

Your flag and my flag, and how it flies today
In your land and my land, and half the world away.
Rose-red and blood red, Its stripes forever gleam;
Snow-white and soul-white—the good forefathers' dream;
Sky-blue and true-blue, with stars to shine aright—
The gloried guidon of the day, a shelter through the night.

Your flag and my flag, and oh, how much it holds!
Your land and my land secure within its folds!
Your heart and my heart beat quicker at its sight—
Sun-kissed and wind-kissed—red and blue and white.
The one flag—the great flag—the flag for me and you—
Glorified all else beside—the red and white and blue.

Your flag and my flag—to every star and stripe
The drums beat as hearts beat, and fifers shrilly pipe.
Your flag and my flag—as blessing in the sky!
Your hope and my hope—it never hid a lie!
Home land and far land, and half the world around,
Old Glory hears the great salute and ripples to the sound.

The brick flag is of regulation dimensions set in a framework of green enamel brick. It is in every inch and detail of brick construction. The seven red stripes and six white stripes, representing the thirteen original States of the Union are alternately of the South Park cherry red enamel and white enamel brick. The blue field of the Union is of dark blue enamel brick. The snow white stars are white enamel brick. The flag was made entirely by hand work. The places in the blue brick were first cut to receive the forty-eight stars. The latter were carefully cut out of white enamel brick and fitted into their settings. The work required both skill and care and its successful execution reflects much credit upon the Hydraulic employes.

The patriotic idea which has been so beautifully and effectively carried out was conceived by Mr. W. P. Varney, manager of the Hydraulic Press Brick Company, to whom we are indebted for the accompanying photo.

The fervor of patriotism is now the dominant feature of all public gatherings. This was very manifest at the recent annual meeting of the International Rotary Clubs at Atlanta, Ga., where a number of patriotic addresses were delivered by men prominent in business life from the Nation's chief centers of commerce. One of the most impressive of which was made by Reverend Ashby Jones of Augusta, Ga., on the occasion of the presentation to the International Association of a beautiful American flag by the Rotary Club of Augusta. Rev. Jones' address was so beautiful, both in thought and composition that we reproduce it in full with the hope that it will be read by every clayworker in the land, and that the lofty sentiments expressed may find a hearty echo in the mind of every reader, that each may declare anew their undying love for our flag and the spirit of liberty which it typifies.

Augusta Rotarians Present Old Glory to International Association.

"Augusta Rotarians," he said, "eager to have some part in the interpretation of the spirit of Rotary in terms of the high and holy passion of patriotism which today possesses every heart, have commissioned me to present to this convention the flag of our country, inscribed with this legend—'freedom's flag, the signal of service!'

"There are moments in the life of a people when emotion is too profound for words, and when the soul of the nation struggling for utterance can only find expression for the deeper meaning of its life, in some symbol sacred in its association with the past and prophetic of its purpose for the future. To such an hour has this people come, and our eyes instinctly turn to that flag—to that flag whose field, white like the snows of Valley Forge, is striped with regal red—to the bending blue of its national sky all studded with stars whose blended beauty is radiant with the gathered glory of our past. And in that light is revealed the soul of this America.

Flag Symbol of Nation's Soul.

"Yes, the flag of a nation is the symbol of the soul of a nation. Its glory is the story of a people's faith. To follow a flag is to follow the path which the people believe leads to the highest national destiny. To fight for a flag is to be ready to die for a nation's ideal.

"And when we turn to our flag to read its story, it carries us back to the old hall in Philadelphia. Our forefathers gathered there are writing a fundamental statement of their faith. They are writing something which they believe to be true about a man—any man—just because he is a man. They are writing that all men are equal in their inalienable right to 'life, liberty, and the pursuit of happiness.' and that the authority which governs them must be the creature of their own divine right to choose.

"This is their deepest faith in human life itself, just because it is human, and this is their loftiest ideal for the human race. And out of the womb of that faith was born a new nation, and the Stars and Stripes became the emblem of that faith.

"So that according to the definition of that flag, America is not a continent bounded by oceans, but America is an ideal of human liberty.

What Democracy Is.

"Oh, men of America, this is what we mean by democracy: Democracy is not a form of government. Democracy, fundamentally, is an inalienable and divine right of a man to choose for himself. Here is the essence of liberty, whether it be a social, political or religious freedom.

"Freedom is found only in the freedom of the will. Without it, there can be no morality in conduct, there can be no intelligence in citizenship, there can be no reality and sincerity in religion.

"A man can't grow, he can't develop, save as his will is challenged by alternatives of conduct, by opposites of opinion, by good and evil of morality. You may unshackle the man's speech, you may unfetter his hands, you may untie his tongue, but if there be anyone who can coerce that will, that one will send his feet upon errands, choose the tasks of his hand and dictate the very words of his lips. If there be any power in all the world that can lay its restraining hand upon the press, upon the school, upon the church, I care not whether that people be well fed, well clothed, well housed, and even well governed, the more contented, the more certain you may be that, while their bodies are free, their souls are imprisoned in dungeons of death.

"And so I define democracy as a form of government, any form of government where the will of the people is free to find expression, and I define autocracy as any government, any form of government, where a few people choose for many people. Oh, they may choose better than the many people. They may so choose that their choice results in a more efficient government, but we should remember the creed of democracy, the fundamental creed of democracy, that the government is for the people and not the people for the government.

"The supreme task of democracy is not to make an efficient government, but to make an efficient manhood.

The Challenge of Germany.

"This was the issue that confronted the American people in the few months that are gone. The people who choose, the few who choose for the many in Germany, demanded of us that we should cease to sail the high seas.

"And there rose up all over America those who pictured to us the horrors of war with its pain and its poverty, its blood and its cares, and then they pointed to the temporary disadvantage that we would be under in ceasing to sail the high seas.

"Ah, if the question had been so simple and unrelated as to be simply a question of whether for the time being we might not surrender the commercial advantage of sailing the high seas, we might have considered it. Nay, but the question was not unrelated. It was deeply rooted in the very soil of civilization itself. We were asked to do infinitely more than surrender a commercial advantage, not simply to surrender sailing the high seas, but to surrender the right to sail the high seas.

"And if, oh! if we had surrendered that right and Germany had been victorious, we would have handed down to our children and our children's children the indelible shame, not simply of having surrendered our own freedom, but the liberties of the world.

Must Fight or Change Flag.

"But, after all, each generation must choose its own flag, giving its own definition to its national life. Is that our flag, and is its definition of America, our America? When Belgium was raped and the fertile fields of France drenched in blood, when Serbia was left a desert of dust and ashes, and when the hitherto free highway of the seas was soiled with the bloodstains of women and children, it became inevitable that we must either fight or change our flag.

"And strange, strange spectacle in this American land of ours there were blind ones who could not see the light of those stars, and deaf ones who could not hear the voice of human wrongs, and they cried—'Wait until America is invaded, then our sons will leap to the defense of our flag and our country.'

"O ye of little faith, did you not understand that when Prussian legions first crossed the Belgian border, that America was invaded? For then it was that autocracy struck its first blow at democracy. And ever since that day, the place to defend America has been upon the soil of Belgium and France.

"If we had but one flag, rather than place it upon the encircled dome of the Capitol at Washington, I would place it in the hands of gallant Pershing, to keep knightly company with the Union Jack and the Lillies of France, for where human liberty is at stake, there fights the guardian soul of America!

"And as timid hands would restrain us from this, the supreme task of our nation, and narrowed sympathies would limit us once again to our ancient national isolation, I can almost hear the voice of James Russell Lowell, prophet poet, speaking to that flag of our faith:

"Be thou no anchor, O my faith, to lie on oceans' oozy bed,
dim fathoms deep,
Away from wind and waves, and e'en remote from day's
great eye.
Thy task to cling and clutch and keep this little bark of mine
in front the selfsame sweep
Of ocean's shore, o'er head the selfsame sky;

"Nay, rather, when the winds are free,
Be thou the needle, loyal to thy North,
Bidding my bark remotest isles explore.
Better go down amid the waves' wild roar
Than rot in land-locked bays
And go not forth at bidding of the wild, beseeching
waves."

TIMELY HINTS.

"Every busy dollar does its bit," is the slogan of the Consumers' League of Indiana. It's a good slogan; carrying a vital idea—let's keep the dollars busy.

This is no time for frenzied retrenchment in business, nor is safety to be found in parsimony. Let us practice pushing business, war or no war.

"Having a heart" is a good thing in business as well as in fellowship, and the friendly feeling should be extended to competitors as well as to customers, and this applies to all lines of trade, including brick and tile.

BUILD WITH BRICK.

A Sign Which He Who Runs May Read.

THE TRADE SLOGAN, "Build With Brick," which originated with The Clay-Worker, has proven a very happy catch phrase. It has been adopted by trade boosters generally throughout the country and is seen in many forms, from stickers on envelopes and other stationery to posters placed in conspicuous places. One of the most telling "Build With Brick" signs that has come to our attention is an illuminated sign over the entrances of the Standard Brick Company's office at Macon, Ga. The genial and hustling manager of that company, Mr. W. E. Dunwody, quick to appreciate the value of impressive publicity, has made the slogan a household word in his field, which includes considerable territory in the vicinity of Macon.

Illuminated Sign Over Entrance to Office of Standard Brick Company, Macon, Ga.

The sign is 24 feet high and is an electric flashlight that catches the eye of all who pass that way. The lower cross-bar is made in the shape of the trademark of the Standard Brick Company. By this and other clever advertising stunts, Mr. Dunwody is impressing the people of Georgia with the importance of brick as a building material. This sign and his other "Build With Brick" posters are just starters. He follows them up with interesting literature that tells of the superiority of brick in a convincing way.

We all know in a general way that the brick home is the most desirable from the standpoint of durability and economy. If prospective builders can be brought to see this there will be fewer burnable buildings erected and more of the safe and sanitary brick. Naturally, when one builds a home he wants the best that his money can buy, and it is up to the brickmaker to demonstrate that brick is both the best and the cheapest.

How the subject appears to students of the question is indicated in the following excerpts from a prize essay:

Why Build With Brick?

"Why should we build with brick? Because brick is the one material which satisfies all the demands of the modern builder—endurance, safety, comfort, health, beauty and economy.

"Of the materials offered for building, which is the most permanent? Wood decays in the course of ten or fifteen years. The stone generally used for building purposes will last longer than wood, be prettier and look more imposing. But stone will gradually decay and crumble away. Brick will not decay, because it is now so made that it resists the action of water, heat and cold. By the 'ultimate test' of everything, time, the durability of brick has been proved.

"After being baked for days at a white heat, the modern vitrified brick is wholly unaffected by the heat of fire. Thus we see by using brick we can help lessen the disgracefully large per cent of loss by fire in America; for, according to government reports, the larger per cent of the losses is due to wood structures.

"The walls of the brick buildings are thicker and less penetrable than those of a wood structure, thereby being cooler in summer, warmer in winter, and deadening to sound. Because of the composition of brick, no decay, which is injurious to health, takes place.

"The beauty of brick buildings is almost unsurpassed in modern architecture, for the possibilities which the many shades of brick now obtainable afford in pattern work and artistic touches are almost unlimited.

"Many of the best examples of brick architecture in England, Holland and Belgium are noted for their pattern work.

"Though a building is durable, safe, comfortable and beautiful, we can possess it only on condition that we are rich, if it is not an economic proposition. The first cost of building with brick is about 10 per cent more than the first cost of building with wood, but it is much less than that of a stone one. When the first cost is paid the cost of a brick building is complete, whereas the wood building must be repainted and repaired frequently. In about ten years the continual cost of painting and repairing would pay the 10 per cent difference. Why not pay more once than to be continually dropping a nickel in the painter's hat and have a building that is always in repair and just as valuable, if not more so, twenty-five years hence as it is now? The brick structure will command a higher price any time than the wood building, and will not so deteriorate in value as it grows old. The insurance on brick buildings is another economic advantage of brick, for the insurance rates on structures of brick are always lower than the rates on buildings of wood.

"Wood has just one weak argument in its favor, stone has about two stronger ones, but brick outshines them both when they are at their best, and fills all six requirements: everlasting endurance, safety, comfort, health, beauty of design and decoration and comparative economic value."

CONGRESS OF HUMAN ENGINEERING.

Bulletin No. 16 of the College of Engineering, Ohio State University, is a book containing the detailed story of a congress of human engineering, being the report of a great gathering at Columbus, Oct. 26, 27 and 28, 1916. That great meeting is a matter of history, but this is a record of the history in printed form which is a valuable acquisition to proceedings literature, and it is worth studying and filing for future reference.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

Part XIV—Producer Gas.

THE INCREASING tendency to use producer gas in the clayworking industries, the comparatively recent practical application of it to periodic kilns, the diminishing supply of natural gas, and the prohibitive cost of oil, make a discussion of this new-old fuel a pertinent one.

A producer in its elementary form is simply a deep firebox with a grate bottom and a closed top. The coal is dumped into the box from above and burns on the grates where the ash accumulates. The draft may be induced or forced, and accordingly we have suction and pressure producers. The pressure producer is the type used in clayworking factories and steam is introduced with the air. We will limit our discussion to this type of producer.

The fuel bed may be divided into four zones—ash, combustion, dissociation and distillation. The oxygen in the air entering through the grates and ash converts the incandescent carbon in the combustion zone into carbon-dioxide (CO_2). If the fuel bed is shallow, the gas escaping from the top of the fuel bed is largely carbon-dioxide and nitrogen, but if the bed is deep, the carbon-dioxide, after the air is exhausted, gives up one molecule of oxygen to the incandescent carbon. It would be more proper to say that the carbon will take oxygen from the carbon-dioxide resulting in two molecules of carbon-monoxide (CO), which is the chief combustible in producer gas. This dissociation of carbon-dioxide takes place at a low red heat.

Water vapor passing over incandescent carbon is also dissociated, resulting in hydrogen and carbon-dioxide at low temperatures or hydrogen and carbon-monoxide at high temperatures. Carbon-monoxide cracks at low temperatures, forming carbon-dioxide and carbon, but this reaction decreases with increasing temperature and around 1800° F. does not occur at all.

The volatile bases in the fuel are driven off and dissociated in the distillation zone and the resulting products pass into the gas flues. The heavy hydrocarbons by reaction with the moisture and carbon are dissociated into hydrogen, carbon-monoxide, some carbon-dioxide and methane (CH_4) in the series of lighter gases, with the heavy hydro-carbon (tar) products at the other end of the series. The higher the temperature at which the distillation occurs, the greater the volume of hydrogen and carbon-monoxide, while at low temperature there is an increase in hydro-carbon gases and a greater quantity of heavier tar product. In view of the several reactions which occur in order to produce a profitable producer gas, it becomes evident that several important factors must have the maximum efficiency value.

(1) The character of the coal.
(2) The depth of the fuel bed.
(3) The character of the ash.
(4) The volume of steam.
(5) Temperatures in the producer and of the producer gas.
(6) Operation of the producer.
(7) The size and construction of the producer.

Anthracite coal and coke are the best fuels because they are practically free from volatile hydro-carbons from which soot and tar are developed, and the resulting gas is carbon-monoxide, carbon-dioxide and hydrogen. These fuels are sized or may readily be sized, are free from dust and do not swell in burning. Dry, non-caking bituminous coals are better than the caking coals, in that they may contain less tar products, and also in that they do not swell, which tends to close up the draft spaces. The swelling however, is not so serious because it can be controlled by the frequency of the firing and stoking.

The depth of the fuel bed is a very important factor and it varies widely with the character of the coal. It is obvious that a shallow bed, such as is essential in flat grate firing, would defeat the purpose of the producer. The purpose of flat grate firing is to secure a maximum degree of complete combustion in the first instance together with a maximum temperature. The conversion of carbon into carbon-dioxide is a heat producing reaction, while the dissociation of carbon-dioxide to carbon-monoxide is a heat absorbing reaction, and in consequence flat grate firing should be limited, as far as practicable, to a combustion zone. This gives a minimum of carbon-monoxide and a maximum temperature. The high temperature is essential in the distillation of the hydro-carbons and in their dissociation into the lighter gases, and also prevents the dissociation of carbon-monoxide into dioxide. The more complete the initial combustion, the less secondary air will be required, and in consequence there will be less cooling of the combustion gases and its attendant evil effects. We do not wish to give the impression that carbon-monoxide is not present in a grate combustion. Carbon-dioxide is strongly oxydizing at high temperatures and in contact with the incandescent coal some of it will be reduced to carbon-monoxide even though there is an excess of free oxygen, but the development of carbon-dioxide will be greatly in excess.

The bed of glowing coals in the producer must be of sufficient depth to insure complete absorption of the oxygen from the entering air and an additional depth to produce the dissociation of the carbon-dioxide and water vapor. It is misleading to separate the incandescent fuel bed into zones, because there is no division line. In the bottom, because of the maximum oxygen supply, there is a maximum degree of complete combustion. As the free oxygen diminishes, the carbon, greedy for oxygen, begins to feed upon the carbon-dioxide. Perfect operation would be complete absorption of the oxygen and complete dissociation of the carbon-dioxide and water vapor. The dissociation reactions, as above stated, are heat absorbing. For example, a pound of carbon to carbon-dioxide develops 14,544 B.t.u. and generates 3¾ pounds of the gas. The reduction of this gas to carbon-monoxide consumes 10,170 B.t.u.

The size of the lumps of fuel materially affect the depth of the bed and the reactions. If large lumps with no fine material are used, little resistance is offered to the passage of the gases and the essential surface contact of the air and gases with the fuel is limited. There must, therefore, be a deeper fuel bed to insure complete reactions. The finer the material the shallower the bed. Very dusty material, which would involve a correspondingly shallow bed, is objectionable in that a higher pressure is necessary, which increases the tendency to cut through the bed in spots. It is hardly necessary to mention the fact that such an operation would result in a poor gas—high in carbon-dioxide in the hot spots and high in heavy hydro-carbons and tar over the larger cool areas. A mixture of lump coal and slack gives trouble in that the lumps roll to the sides or center and form chimneys, while the slack blankets the area in which it accumulates. Nagel, in "Producer Gas Fired Furnaces," gives the following as the proper depth for several fuels: "One-inch coke, 30 inches; 1½-inch coke, 45 inches; 2¼-inch coke, 72 inches; ¾-inch bituminous coal, 22 inches; mine run coal, 60 inches to 80 inches. Dusty fuels require less height than coarse, loose fuels." It must be noted that no set rule can be given for the depth of the fuel bed. It is determined by the character of the fuel and the pressure. The depth given by Nagel for mine run coal would be excessive for some mine run coals which are notably dirty.

The character of the ash is important in the selection of a producer coal. An ash that clinkers badly builds up scaffolds around the sides, gradually reducing the area to a small pot in the center. In one instance the clinkers were so troublesome that it was necessary to have an extra producer, and each producer could operate continuously only about forty-eight hours.

Steam has an important part in producer gas and in the operation of the producer. It, with the air, cools the ash of the coal, and in this work it is nearly double the efficiency of air on account of its higher specific heat. The heat thus taken from the ash is returned to the combustion zone. Besides the cooling effect, the steam tends to disintegrate the weaker clinkers, and if their formation is not entirely prevented, their structure is so weakened that they are easily broken up in removing the ash from the pit. Water vapor is dissociated in contact with glowing carbon, forming hydrogen and carbon-monoxide. This dissociation is practically nil at temperatures below 1,200° F., but increases with advancing temperature. At 1,800° F. the dissociation is above 90 per cent., and about 2,200° F. is practically complete.

The dissociation of water vapor is a heat absorbing reaction. A pound of steam contains 1/9 pound hydrogen and 8/9 pound oxygen. Combustion of hydrogen develops 62,028 B.t.u., and 1/9 pound would give 6,892 B.t.u. Conversely, the dissociation of one pound of water vapor will absorb 6,892 B.t.u. In the dissociation there is set free 8/9 pound of oxygen, which combines with the carbon to form carbon-monoxide. A pound of monoxide develops 4,374 B.t.u. and 8/9 pound will deliver 3,888 B.t.u. The net cooling effect of the water vapor is, therefore, 2,904 B.t.u. per pound of vapor.

The absorption of heat by the dissociation of carbon-dioxide has been mentioned, and the cooling effect of this reaction is in addition to the cooling effect of the water vapor, and it is further noted that to insure complete dissociation of the dioxide and the maintenance of the monoxide and also that the dissociation of the water vapor may be complete, temperatures around 2,000° F. must be maintained in the dissociation zone. The initial temperature of the gases rising from the combustion zone, including radiation and conduction, together with the heat of combustion taking place in the dissociation zone, must be sufficient to maintain the required temperature in the latter zone. This, in a measure, determines the amount of water vapor which may be introduced. If we could use steam entirely, we would get a gas consisting of hydrogen and carbon-monoxide—a 100 per cent. combustible gas, but water vapor will not support combustion, and we must introduce air to develop and maintain the necessary temperatures in the producer.

Air contains by weight 23 parts oxygen and 77 parts nitrogen. A pound of air, then, will contain 23/100 pound of oxygen which, in combination with carbon and burned to the final resultant monoxide gas, will deliver 1,006 B.t.u. The nitrogen which accompanies the oxygen is simply a dead load which must be heated up and carried through the various stages until the waste gases are turned back into the atmosphere and the heat which it retains is a net loss. Instead of a 100 per cent. combustible gas, the average producer gas varies between 30 per cent. and 40 per cent. combustible.

We must use enough air to provide for all the producer losses, including heating up and dissociating the steam. If an excessive amount of water is used, the temperature is lowered and in consequence carbon-dioxide—a non-combustible—is formed, displacing the monoxide—a combustible—and also some of the vapor will pass through unchanged. The latter can be removed by condensation if the gases are cooled, but unless the initial heat is returned to the producer, the fuel loss chargeable to the producer is increased. Carbon-dioxide, on the other hand, cannot be removed and it is simply a gas burden which must be carried to the end. The weight of steam used varies from 20 per cent. to 60 per cent. of the weight of the coal gasified, depending upon the character of gas desired, character of the coal and fusibility of the ash. Average practice would be nearly one boiler horse-power per ton of coal per twenty-four hours, which would approximate 33 per cent. Mechanically operated producers require two thirds this amount, or 16 to 20 pounds of steam per ton of coal in twenty-four hours.

In the analysis of Ohio coal, given under combustion of coal, we had .69 pound of carbon. Thirty-three per cent. of the weight of the coal would be .33 pound of steam per pound of coal. From this data we can determine the relation of steam and air. The oxygen in the steam will be in the proportion of

$$\frac{18}{16}=\frac{.33}{X}$$

from which we find X = oxygen = .29 pound. The carbon taken up by this oxygen will be

$$\frac{29}{16}=\frac{X}{12}$$

X = .22 pound. This from .69 leaves .47 pound of carbon to be burned by the air in the ratio of

$$\frac{.47}{12}=\frac{X}{16}$$

and X = oxygen from air = .62 pound.

The ratio of oxygen to air is

$$\frac{23}{100}=\frac{.62}{X}$$

and X = 2.7 pounds of air.

The weights of steam and air reduced to percentages are

(Continued on page 72.)

Kiln Department

THE AMERICAN-HAIGH CONTINUOUS KILN.

By Lambert Haigh, Kiln Expert, American Clay Machinery Co., Bucyrus, Ohio.

THE AMERICAN-HAIGH continuous kiln has been in use in the United States for a number of years and during that period of time it has been improved and brought up to a high standard of economy for the burning of clay products. The kiln engineers of the American Clay Machinery Company take into consideration and give careful attention to the fact that the burning of clay products is just as essential to the success of the plant as the proper machinery and dryers. With this in view, and the fact that more than 50 per cent. of the plant expenditure during construction is for kilns, they have followed five essential points, i. e.:

The best possible construction;
The lowest cost in expenditure;
The minimum cost of up-keep;
The lowest fuel cost;
The lowest labor cost.

With these facts in mind one can readily see from the accompanying drawing the excellent and yet simple construction of the kiln. A careful inspection will show that the floor of the kiln is solid. The kiln foundations are not cut into by lateral ducts, see A (Fig. 1); the flues for the draft for the kiln are placed on each side of the kiln, see B (Fig. 1), and the connections to the chambers are made through the kiln wall using a sheet steel hood, see C (Fig. 1) to complete the connections.

The kiln is built in the form of a tunnel, the walls being large and heavy to support the main crown, the doors into the kiln are directly opposite each other and are placed, in distance apart from each other, according to the material which the kiln has to burn. Where economy of space is essential, the width and height of the kiln also varies according to the material to be burned, this decision, of course, resting entirely with the owner and kiln engineers, but a variety of ware can be burned in any Haigh kiln. The main crown of the kiln has small openings, 4-inch diameter, through which slack coal is fed during burning. There is also left in the crown in every chamber an opening, see E (Fig. 2), which is connected to the waste heat duct, see D (Fig. 1), by a hood, see F (Fig. 2). After the arch is placed in position and the feed hole chimneys and waste heat duct are built, the kiln is then covered over on the top with 21 inches of dirt filling.

The advantages of using a continuous kiln is well known to most clayworkers. The first and foremost advantage is the saving of fuel. From data secured from scores of Haigh kilns at present in use, the saving of fuel is 50 to 55 per cent. over the down draft or up draft kiln. We also find that there is quite a saving in burning labor. The setting labor is just about the same in all kilns, this is generally piece-work. The setting in a continuous kiln of the Haigh type is generally known as two-headers, two stretchers, 5 over 2 for brick and 2 headers, 2 stretchers, 7 over 3 for paving blocks. Fig. 3 shows plainly the setting used, in which the reader will notice that all brick have one straight face.

In the burning of the kiln a starting wall is built at one end of the kiln, as is shown in Fig. 4, three fire wickets are built permanently in the doorways and from these three fires the first four chambers of the kiln are practically watersmoked and the full heat for the first chamber is reached. By placing the connection, see C (Fig. 1), on chambers 2, 3 and 4, the heat is drawn through these chambers. In chamber No. 5 the first paper will be placed, this paper being put clear across the chamber (see Fig. 2). This acts as a dead

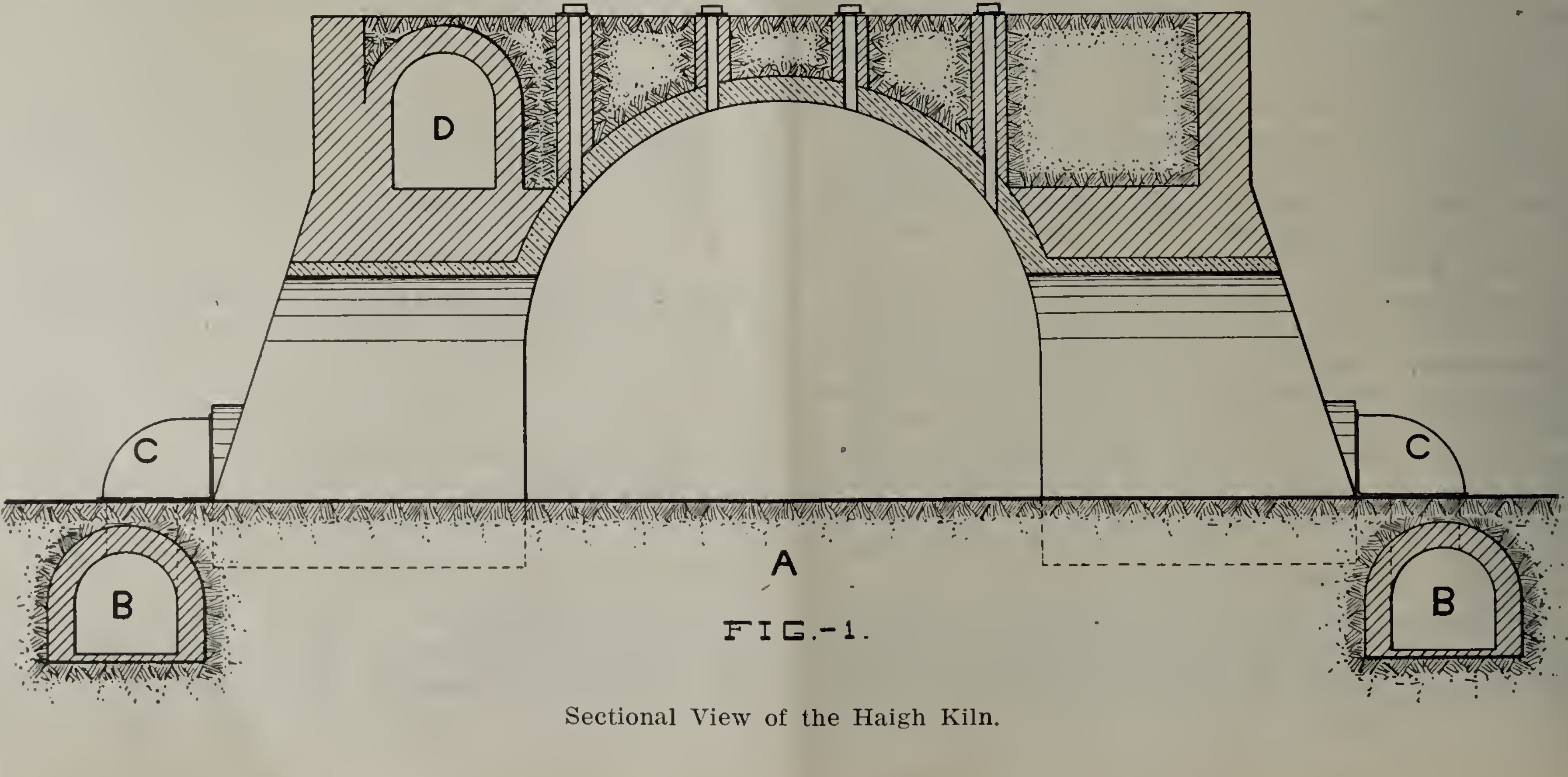


FIG.-1.

Sectional View of the Haigh Kiln.

wall the same as one built of brick would act, until the fire reaches it. The reason for placing this paper is, so that the fan or stack will pull the fires ahead instead of pulling in the cold air from where the setters are working. After the fifth chamber, every chamber has a like paper partition. When chamber No. 1 has reached full heat point, then top firing with slack coal is commenced. The heat from No. 1 chamber is being drawn ahead into chambers 2, 3 and 4 by the fan or stack draft and it will be found that chamber No. 2 is nearly as hot as chamber No. 1 and top firing can be started. With fires from Nos. 1 and 2 being now in use, the advanced heat from these extend through chambers 3, 4, 5 and 6. It can be here stated that the hoods for draft for the kiln are moved along in accordance with the speed that the heat travels. When chambers 1, 2 and 3 are all being burned, the heat extends into chambers 4, 5, 6, 7 and 8, and chambers 7 and 8 are being water-smoked when burning in chamber No. 1 is completed, chamber No. 4 is ready for firing, and so on through the whole kiln. The top firing is generally 24 feet ahead of the side fires when the kiln is in full operation.

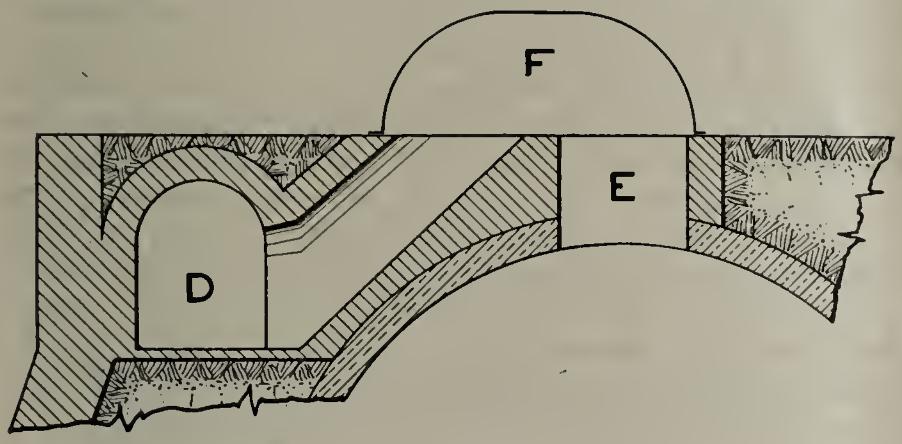


FIG.-2.

Looking closely at the pictures here given, the reader will notice that the doorways are used for the firing of the kiln, a temporary firing wicket is built into each doorway. The following advantages can be claimed by the use of a Haigh continuous kiln:

(1) Perfect control of draft.

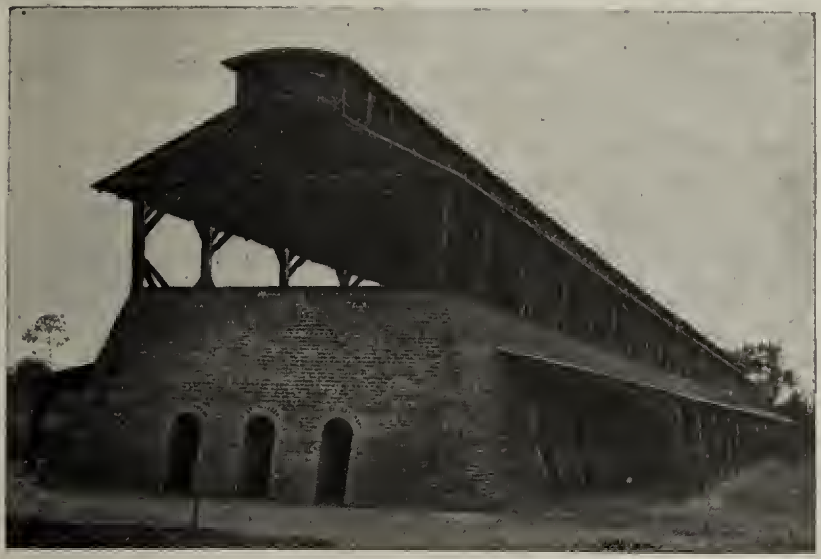


Fig. 4. End Wall of Haigh Kiln.

(2) Uniform products obtained due to having uniform temperature throughout each chamber.

(3) It can be installed to suit any location.

(4) No disadvantage occurs by conflict of setters and unloaders, as the unburned wares enter at one side of the kiln and the burned wares are removed at the opposite side.

(5) The advantage of being able to use coal, oil, wood, natural or producer gas for fuel.

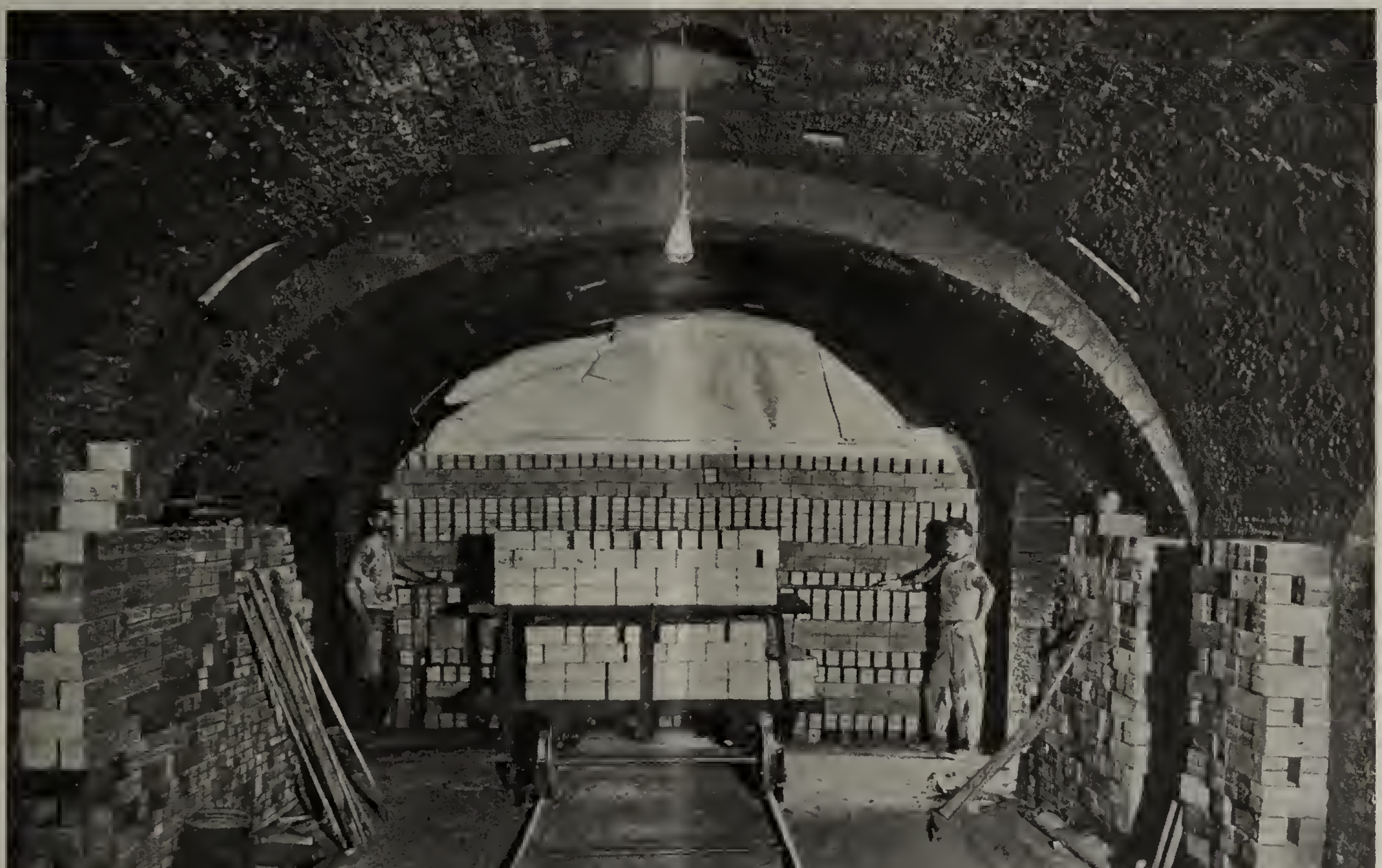


Fig. 3. Interior of Haigh Kiln, Showing Method of Setting Brick.

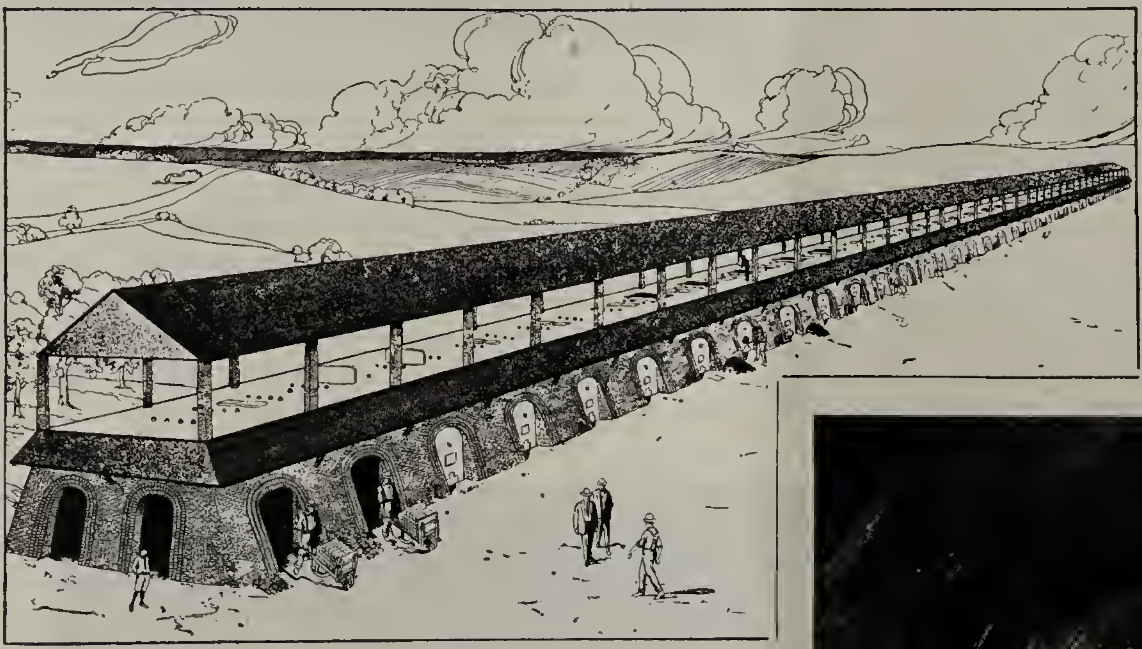
(6) The utilization of waste heat for drying purposes, which is successfully used on a large number of plants.

(7) A small section can be built and added to at any time without any additional expense, excepting that of building the other addition.

(8) The advantage of being able to burn all classes of clay wares, including paving block, building brick, hollow ware, fire brick, etc., without any change in the kiln being required.

The first of these advantages—"Perfect control of draft"—is due to the fan method which we use. The fan runs at a constant speed, the change of draft being obtained by changing of the hoods or connections.

The uniformity of products obtained is due to the combination of side and top fires, the heat advancing through the chambers ahead of where the kiln is being fired brings the chamber up to full heat point before the side fires are used, this heat being distributed equally throughout the entire chamber. When the side fires are started the kiln is then close to setting point and these fires are used only until the required settle is obtained or the required time to burn the wares is ended. It can also be here stated that by using the side fires, very little fuel is used from the top of the kiln. The top fuel required varies from 10 per cent. to 20 per cent. of the total amount used, the remainder being used on the side fires.



The Haigh Kiln Showing Detail of Operation

Interior of Haigh Kiln, Showing Method of Setting Tile.

The Haigh continuous kiln is adapted for any location. The kiln can be built in one long line if necessary, in two lengths placed side by side, if location is suitable, or in a horse-shoe shape. Any of these kilns will still have the same advantage of having the wares enter one side and removed from the other side.

The fuel advantage is one of great importance. Without any change whatever, the side firing can be obtained by coal, natural gas or wood. There is also no change necessary in the kiln for oil firing, the only change being an exterior one, in fact, that the oil must be conveyed by means of pipes to the kiln, the same holds good for producer gas, the change being that the gas must be conveyed to the kiln through the gas connections.

In Fig. 1, D, can be seen the duct for taking the waste heat from the kiln after the wares have been burned and the fires have advanced 60 feet from the burned wares, the waste heat from those cooling wares can then be taken from the burned wares to the dryer by fan draft, as shown in Fig. 2.

In the construction of an American-Haigh continuous kiln, the manufacturer does not have to wait until the whole kiln is built before he begins to use the same. After a few sections are built, these sections can be used while the rest of the kiln is under construction. The kiln can also be extended at any time it is desired to do so. A large number of these kilns have been and are being enlarged by this method.

In most of the clay products plants in this country more than one class of product is made. Nearly all paving block plants manufacture building brick also and many of them hollow ware; likewise, the drain tile plants manufacture hollow ware, and many fire-proofing plants manufacture fire brick. This is one of the many advantages obtained by a side-fired continuous kiln of this type. The same kiln can be used for the burning of all these wares, with the possible exception of sewer pipe and pottery.

Fuel Consumption: Generally the first question asked is: "How much coal does it require to burn a thousand brick, or a ton of hollow ware?" This is a question which cannot be answered positively and correctly for each individual plant, as there is such a variation in materials to be burned. We find from information gathered from scores of Haigh continuous kilns that we are burning some at as low a fuel consumption as 270 pounds of coal per thousand brick; others vary in figures up to 600 pounds of coal per thousand brick. We also find that we are burning paving block with 800 pounds of coal per thousand block, and as high as 1,200 pounds of coal per thousand block, yet we find this same variation takes place in all classes of kilns, and when we look into the saving in fuel, we find that the percentage saved is the same. If it takes more fuel on one yard than it does on another, with the identical continuous kiln on each, we also find that the same variation exists with up draft or down draft kilns, the variation being caused by the variation in the shales and clays to be burned.

Cost of Construction: This is another matter that is a variable one, due to the fact that building materials are not by any means the same in all localities, and here again the kiln engineers have been obliged to make comparison of costs. In doing this, it is strange, yet true, that the labor costs on kiln construction has shown the least change; fire brick has shown the greatest variation, due, no doubt, to the fact that fire brick plants can only be found in spots and the builder who has to ship fire brick a long distance has to bear the added expense in construction. Nevertheless, we find that the actual cost of construction is just about that of the Bee-Hive down draft kiln for the same daily capacity of burned wares, and when the reader takes into consideration the saving of 50 per cent. of fuel in these times of high coal costs, he will readily see the advantages of installing a kiln of this type. At the present time there are quite a number of American-Haigh continuous kilns being installed, but a more pleasing and significant thing is the fact that many of those that have installed a Haigh continuous kiln are at this time enlarging the same, which proved its success. The slogan, "Repeat orders show success," is likewise true of "Repeat extension shows success."

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE GENERAL ABSORPTION of public attention by questions connected with the war, the uncertainty of business men as to developments and the demands made by the Government for steel, lumber, etc., has caused a considerable slowing up in building operations all along the Pacific Coast. It is thought, however, that brick and concrete building has only been postponed; and that brick construction will shortly recover and equal if not exceed that of previous years. In the meantime, deliveries on work already under way are very large, and practically all of the plants about San Francisco Bay are working full capacity.

Reports of building departments of all the important cities along the Pacific Coast show a falling off for the month of June as compared with the same month for last year. In San Francisco there was a drop from $2,046,000 to $1,796,000, the greater proportion of the decrease in value being accounted for by a decrease in the use of steel and lumber. In Los Angeles the value of the permits dropped from $1,037,000 to $969,000; in Seattle from $371,000 to $447,000, in Portland, Ore., from $979,000 to $444,000 and in Oakland, Cal., from $423,000 to $362,000.

The Steiger Terra Cotta & Pottery Works, whose plant in South San Francisco was recently burned, is making good progress with the work preliminary to rebuilding. The old site has been pretty well cleared, and preparation for construction are well under way. The company had a considerable quantity of brick on hand at the time of the fire, and sales are being made from stock right along. Some orders which the company has been unable to fill in this way have been turned over to other local manufacturers.

Lee R. Dennison, of the Steiger Terra Cotta & Pottery Works and son of W. E. Dennison, president of the company, was married at Redwood City, Cal., early in June to Miss Alice M. Fink, of that city.

O. W. Tupper, president of the San Jose Brick Company, of San Francisco and San Jose, Cal., acted as host to a considerable gathering of San Francisco contractors and material men a couple of weeks ago. The visitors spent several hours in an inspection of the brick works at San Jose and were later given a taste of San Jose hospitality at the home of Mr. Tupper.

A. S. Cunningham, manager of a new brick company which has begun the construction of a plant at Ione, Cal., has spent the last three months in the East and Middle West looking over clay manufacturing plants at various points. The company has extensive clay deposits in Amador, near Ione, and plans to begin building at once.

Vernon Clark, of Phoenix, Ariz., Arizona representative of the Los Angeles Pressed Brick Company, of Los Angeles and Richmond, Cal., has been out in the Flagstaff country closing some contracts for contemplated work there.

A great deal of activity is manifest all along the Pacific Coast in the developing of magnesite properties and in the establishing of plants for making magnesite brick. This is due to the great mining activity and to the increasing need for furnace and flue linings. In California the activity centers largely around Porterville, Cloverdale and the Piedra section of Fresno county. Near Porterville, the Porterville Magnesite Company has installed a 125-foot kiln, seven machine drills, a compressor plant and has increased its electric power equipment until it now has in operation 330 horsepower. The Refractory Magnesite Company is figuring on installing a plant at Cloverdale; B. H. Maddox & Co. are developing deposits near Rutherford; and the Weillman-Lewis Company, of Los Angeles, has contracted for the first unit of this plant near Piedra, to be erected at a cost of $100,000.

In the State of Washington some important development in the Inland Empire section is promised by the American Fire Brick Company, of Spokane, Wash., and its allied corporation, the United States Magnesite Company. The former company has secured the large plant of the Spokane Clay Products Company at Lacy and Liberty streets, Spokane, in which new machinery will be installed at a cost of about $15,000, giving the works a capacity of 100 tons of magnesite brick and ferromagnesite per day. The raw material will be secured from the deposits of the United States Magnesite Company near Springdale, Wash. C. P. Oudin is president of both the American Fire Brick Company and the United States Magnesite Company.

The Trenton Potteries Company, of Trenton, N. J., has filed a certified copy of its articles of incorporation in California, and it is rumored that the company contemplates operating in this State.

The Theo Dittell Company has secured a site with good rail and water communications at Antioch, on San Francisco Bay, and is now putting in a kaolin refining plant. The company has control of extensive deposits of kaolin in the Amador County field, and will begin operations at the Antioch plant very soon.

Richard Loynes, well known in the brick manufacturing field of Southern California, died at his home in Long Beach, Cal., a couple of weeks ago.

The Nez Perce Brick & Tile Company, Nez Perce, Ida., which has been closed down for some time, is now being remodeled and added to, and will soon be reopened. It will hereafter be under the management of E. G. Bergh.

H. M. Mitchell, of Santa Rosa, Cal., has reopened the Hilton Brick Works at that place.

The Whiting-Mead Commercial Company, of Los Angeles, which for the past fifteen years has been doing a general building material business, is now going into the manufacturing of porcelain ware and enamel ware. A factory is under construction at the corner of Vernon Avenue and Alameda Street, Los Angeles.

The Pacific Porcelain Ware Company, whose plant is located at Richmond, on the east side of San Francisco Bay, has secured a contract from the United States Government for 4,200 pieces of earthenware to be supplied at an early date.

A special election has been called at Modeste, Cal., to vote on propositions for issuing bonds to the amount of $30,000 for a storm sewer and $15,000 for extensions to the sanitary sewer systems.

Fred L. Dickey, W. S. Dickey and R. C. Penfield, eastern men who are interested in the California Brick Company, of Decoto, Cal., and the Livermore Fire Brick Company, of Livermore, Cal., spent some time in California recently looking into the situation and laying plans for the future; and it is understood some changes are in prospect. N. A. Dickey has succeeded F. L. Meyers as manager of the company.

Sunset.

San Francisco, July 5.

ONE OF THE FIRST MONOLITHIC BRICK PAVEMENTS WAS LAID IN TERRE HAUTE, IND., IN 1908.

SO FAR AS IS PUBLICLY known, one of the first brick pavements of the monolithic type was laid in Terre Haute, Ind., in the rear of Hulman & Co.'s wholesale general merchandise building. It was laid in 1908 under the personal supervision of Mr. Anton Hulman.

The pavement has been noticed in the public prints, but the real facts have not been published.

The Good Roads Year Book for 1917, published by The American Highway Association, says in a footnote on page 423, that this pavement "was laid about 1904 on recommendation of Street Commissioner Varrelman, of St. Louis."

Mr. Anton Hulman, of Hulman & Co., in a letter written May 22, 1917, gives the following history of the pavement:

> "The pavement was put down in April, 1908, under the personal supervision of the writer and Ed. Johnson, our foreman. We used an ordinary concrete base of a mixture of about 1 to 7 with native gravel, which contains about the right proportion of sand. The green concrete base was leveled off with a board, but not troweled; before it was set the brick were put in place and hammered down to an even surface, after which the usual grouting was put on.
>
> "In regard to the history of the pavement and what led me up to the idea, I will say that about one or two years previous to putting down this pavement we had more or less trouble with ordinary brick pavement, put down in the old way with a concrete base and cushioned with about two inches of sand—a pavement which runs behind our buildings and which is subject to hard usage, especially where the loading takes place and the horses stand. The horses would persist in kicking the brick out. We got tired of putting the brick back, and the idea struck me, 'Why not put down a concrete base and lay the brick in the concrete? This would probably overcome our trouble.' And after one or two experiments we proved that this was perfectly satisfactory, and we had no further trouble with that part of the pavement. When we decided to pave Ninth and One-half street, in the rear of our buildings, we carried out this same idea."

This pavement, laid by Mr. Hulman in 1908, is of interest to the paving brick industry, inasmuch as it fixes the date and method of construction of one of the earliest of brick pavements laid monolithically, and its history establishes the identity of the designer and builder of that pavement.

Of course, Mr. Hulman had no idea of introducing a new type of brick pavement. He conceived the idea in his attempt to devise a means of surmounting the troubles caused by the old, sand-cushion construction.

It was six years after Mr. Hulman's successful experiment that the modern type of monolithic construction was developed and perfected, and state highways were first laid of that type in Edgar county, Illinois. The construction of these latter pavements brought monolithic construction to the attention of engineers throughout the country.

Monolithic and semi-monolithic construction are now rapidly relegating sand-cushion brick pavements to the discard.

While it is true that modern monolithic specifications have been reduced to a scientific engineering basis differing greatly from Mr. Hulman's design, the principle of a single rigid beam was fundamental as well in Mr. Hulman's idea as in the monolithic pavements developed by Mr. W. T. Blackburn, of Paris, Ill., consulting engineer for The Dunn Wire-Cut Lug Brick Company, of Conneaut, O., and Mr. Alan J. Parrish, contractor, of Paris, Ill., who collaborated in working out modern specifications and devising mechanical means for economical construction.

Mr. Hulman may not have been the first to conceive the idea of monolithic construction, but he was early in the field, and at least the idea was original with him, as it was with others who from time to time and in isolated cases experimented along the same line.

Mr. Varrelman, formerly Street Commissioner of St. Louis, who has been credited with suggesting the Hulman pavement, was an engineer of ability, but he had been in Europe several years when Mr. Hulman laid his pavement, and he has not been in America since about the year 1904 or 1905, or since about three years prior to the time when Mr. Anton Hulman's idea took shape.

That The Good Roads Year Book erred in crediting Mr. Varrelman with suggesting to Mr. Hulman the type of construction is a fact established by a letter written by Mr. Hulman on May 28, 1917, in which he said: "In reference to Mr. Varrelman, of St. Louis, I have never heard of the gentleman. If he was ever connected with any street pavement in Terre Haute, I don't know of it; it is certain that he had nothing to do with our pavement."

Monolithic Brick Pavement Laid in April, 1908, in Rear of Hulman & Co.'s Wholesale Warehouse, Terre Haute, Ind. One of the First Pavements of the Kind Ever Put Down.

FELDSPAR.

Feldspar, which is used mostly in the pottery and enameling industry, these consuming 82 per cent of the production, sold during the year 1916 at an average price of $3 per long ton for crude and $9.30 for ground spar. The total production in 1916, according to the Geological Survey, was 118,465 tons, having a crude value at the mills of $404,689. Feldspar was mined in the following states in the order named: North Carolina, Maine, Maryland, New York, Connecticut, Pennsylvania, Georgia, Virginia, California, New Hampshire and Vermont. About fifty quarries furnished the main output, but a number of small works contributed somewhat to the total.

Written for The Clay-Worker.

EVANSVILLE AND SOUTHERN INDIANA BRICK AND BUILDING NEWS.

BUSINESS WITH the brick makers in Evansville has been rather quiet during the past month yet there is considerable demand for brick in towns and cities in southern Indiana outside of Evansville. The reports received from towns in southern Illinois and western Kentucky are also encouraging. The Standard Brick Manufacturing Company, at Evansville, is furnishing the brick for the large addition that is being erected to the Walker sanitarium in that city. The company is also furnishing the brick for the wholesale warehouse being built by Bierhaus Bros., wholesale grocers at Vincennes, Ind. The same company is supplying the brick for the addition that is being built by the Blackford Window Glass Co. at Vincennes. While a few residences and other buildings are in course of construction at Evansville, building for the month of June was lighter than for the corresponding month of last year. Brick manufacturers and builders in Evansville look for a better business during the months of July and August.

The new plant of the Standard Brick Manufacturing Company, of Evansville, located on the Evansville and Henderson traction line, a few miles south of that city, which was recently completed, is being operated at this time on a small scale, but it is expected after the demand for brick gets better that the factory will be run on full time. The company manufactures a fine common brick at the new plant. The other plants of this well known company in Evansville are being operated on full time and at a full force. John Andres, secretary and treasurer of the Standard Brick Manufacturing Company, says he is not pessimistic over the outlook. He recently made a trip to the central part of the state and said he talked to many business men who were looking on the bright side of the trade picture and who were of the opinion that the sale of the Liberty Loan bonds in this country would mean the turning loose of a lot of surplus money that will find its way to the channels of trade and that this will mean a wonderful boom in the business world and that the brick manufacturers will get their share of the prosperity.

Verne E. Willard, aged 40 years, employed as one of the foremen at the plant of the Crown Pottery Company, at Evansville, died at his home in that city a few days ago after an illness of but a few days.

John Andres, secretary and treasurer of the Standard Brick Manufacturing Company, Evansville, was re-elected one of the directors of the Indiana State Sunday School Association, to serve for the ensuing year.

The new Hotel McCurdy, at the corner of Upper First and Locust streets, at Evansville, was opened a few days ago to the public with a banquet and ball, that were attended by people from several states. The hotel was built at a cost of $550,000 and is said to be one of the finest hotels in the central western states. The Albion Shale Brick Company, of Albion, Ill., furnished the variegated rough-texture brick, used in the facing of the new hotel.

At a meeting of the Evansville Rotary Club a few days ago Edward Koeneman was installed as president and he appointed his standing committees for the year. John Andres, secretary and treasurer of the Standard Brick Manufacturing Company, was named as chairman of the public affairs committee, which is regarded as one of the most important committees of the club. H. C. Kleymeyer, general manager of the Standard Brick Manufacturing Company, is also one of the live members of the Evansville Rotary Club and seldom misses a meeting. The club has over 200 members and is regarded as one of the live organizations of Evansville.

During the past month several streets have been ordered improved in the city of Evansville and some of these streets will be paved with brick. Streets in that city that were paved with brick twenty-five years ago are still in first-class shape, again demonstrating that brick as a paving material has no superior.

Daily newspapers at Evansville almost every day carry several large black lines that read: "Build With Brick." The advertisement is a good investment as the brick manufacturers in Evansville will testify.

The big Blankenburg sewer at Evansville is expected to be finished this fall. It would have been completed by this time but for the heavy rains that greatly delayed the work. It is now eighty per cent. finished. John L. Newman has the contract, the cost of the entire sewer being about $40,000. It connects with the Fulton avenue sewer. The sewer will be 2,808 feet of brick construction, the rest of pipe, making the total length of 12,568 feet. About 3,200 feet will be in alleys. There will be forty-six manholes and seventy inlets. Bids were opened a year ago. The Law avenue sewer at Evansville will be the next to be constructed. The cost of this sewer will be $15,000.

Edward C. Kerth, city building inspector at Evansville, is preparing a new building code that will go into effect on the first of January, 1918. This new code is not to be radical, but will make clear definitions and specification forms and will revise the formulas, many of which in the old code are defective. All the new state laws applicable will be incorporated, so there will be no conflict between the state and city laws.

The various pottery plants in Evansville are being operated on fairly good time and in fact many have been for some time past. The trade outlook is very good and it is expected the plants will be able to operate on good time the rest of the year.

Work has started on paving several of the streets at Grayville, Ill., with brick and when the improvement has been completed the appearance of the little city will be greatly improved.

The wharf of the Ohio river in Evansville has been in a bad condition for some time and an agitation has been started to pave the entire wharf with brick.

There are several fine deposits of fire clay in Spencer county between Lincoln City and Dale, Ind., and much of this clay is expected to be utilized by the brick factory that the Southern Indiana Clay Products Company, of Huntington, Ind., proposes to build at Dale. As stated in a former issue of The Clay-Worker, Roy Gaines, of Dale, is taking stock subscriptions in this new company. A. HOOSIER.

AVOID LONG HAULS.

People in charge of our railway transportation are now striving to awaken the public to the importance of avoiding long hauls. For example, it is urged that people should use coal from the mines nearest to them, and buy food and other products as near home as practical, and not use up so much freight.

There is nothing new to The Clay-Worker in this line of argument. It is a line that has been urged for several years under the caption of cultivating your near-by territory. There has been entirely too much shipping of brick and other clay products from one man's territory into another, and from the other back again, shipments crossing each other and paying more freight than necessary. It has taken a time of great stress for cars, however, to impress the public upon this point.

Clayworkers can not only help conserve the car supply by cultivating more industriously the near-by territory, so as to lessen the number of long shipments to be made and dispose of a greater percentage of their output nearer home, but they can save freight, which lowers the cost to the consumer. Also they can save that order of competition which sometimes leads to unnecessary price cutting, and benefit themselves in many ways. Avoid the long hauls as much as practical. Some of them are necessary, but there are many unnecessary long hauls in clay products which can be reduced by thoughtful consideration and proper co-operation between clayworkers.

BUTTONHOLE TALKS

Exploring the Ancient Pueblos.

OUR ROAD RAN for many miles over a level mesa, winding somewhat and occasionally dipping down into an arroyo, and then jumping up out of it. We glimpsed rocky masses of grotesque shape, all of which we eyed sharply, for we were on the lookout for the famed Enchanted Mesa—The Mesa Enacantada of the Spaniards. We need not have worried, or strained our eyes, for there was no mistaking it when we came to it. Towering high above the level plateau about it, it stood magnificently rugged, majestically impressive. Those riven, precipitous, unscalable sides towering aloft, held the mesa above unattainable and inexplorable to man. Such natural phenomena bring mankind to a realizing sense of his littleness. One stands awed, staggered, speechless. It is quite worthy of the tradition of the Indians, that long time ago it was the site of their home and was accessible only at one place by a dizzy, rocky trail. That once, at the corn planting time, when all the able-bodied inhabitants were called to go to the distant fields to the planting, an awful storm broke. Rain fell in torrents, lightnings flashed in blinding glare and the Great Spirit spoke in reverberating thunders until they all bowed themselves to the ground and hid their heads. Finally, when the storm had passed, they sought their home at the top of the mesa, but stood aghast, for their rocky pathway was shattered and demolished and there was left no way to ascend. Three hundred feet of precipitous wall confronted them, a wall impossible to scale. They could hear the wails of the invalids and children at the top, but were helpless to succor. It was the will of the Great Spirit. Massive, lonely and grand, the Enchanted Mesa has since stood and will continue to stand as one of nature's most impressive monuments.

W. D. Gates.

Farther along we came to the Sky City of Acoma. Perched on the top of another mesa, not quite so inaccessible, it has been for ages a veritable City of Refuge. Old at the time of the first Spanish visitors, nearly four hundred years ago, it is still occupied much as it was when they first saw it. The top is a bare rock and all that they use, food, fuel, water or building material, has to be brought to it from a distance and carried up its precipitous sides on human shoulders. We climbed the old dizzy, precipitous, original trail, in a crevice in the rocks; put our feet in the worn footholes that had felt the tread of the moccasined feet of generations now dead; nervously we clinched our fingers in the handholes that had saved other dizzy heads from falling and, with windings and twistings, finally made our way up through a narrow crevice and underneath a huge rock, fallen and jammed into the crevice, above and came to the top. The largest church of the Pueblos is built on the top of this rock, the roof supported by massive timbers 40 feet long, all of which were cut at a distance, brought here and lifted to the top by Indian hands. The houses are similar to those in the other Pueblos, one, two and three stories high, entered by climbing ladders and then going down through an opening in the roof. Here we saw the original primitive windows in the form of sheets of mica imbedded in the walls. This city of refuge was often tested. There have been battles and sieges which it withstood, for one man, supplied with boulders, at the top of that trail, could clear it of climbing enemies by simply dropping an occasional rock.

Our horizon today has been most pleasant and we have carried it eighty-four miles. Early in the day it was outlined and inclosed by the long horizontal lines of mesas with the jagged lines of their terminals. Inside these were the roughly fantastic outlines of castles and domes carved by wind and water at the diction of Mother Nature herself. Later on, the horizon was bounded by mountain ranges, clear cut, jagged, massively extended. At sunset, directly before us, Mount Sandia stood out glorified by the last rays of the sun, that all seemed to center there and hold it vibrant against a wondrous background of pulsing, changing, opalescent tints. Then we topped a height and there before us, as we turned, Mount Manzana, catching the sunset rays diagonally, clothed itself in wondrous filmy pink, while below all the seemingly level mesas dimmed into a sea of indescribable soft neutral tones Then, second by second, the colors softened more and more, turning to gorgeous purples and then to blues, growing always softer and dimmer, until they merged together in the darkening night, while the clouds hung fiery, flaming banners streaming down above. GATES.

CLAY WORKERS GETTING TOGETHER IN THE SOUTH.

THAT DIVISION of the clayworking industry in the South which manufactures hollow building tile has been getting together and developing team work through association effort and forming the Southern Hollow Tile Association. Heretofore most of the hollow tile organization work has been in the northern and eastern states, and because of the limited number of industries and their wide distribution in the South there has not heretofere been any effort made to formulate a closer co-operation among the southern manufacturers; that is, a district organization such as may be found in northern and eastern sections. Now, however, the South is getting in good shape and has a full-fledged hollow tile association, with James T. Howington, of the Coral Ridge Clay Products Co., Louisville, Ky., as president; J. S. Bone, Oconee Brick & Tile Co., Milledgeville, Ga., vice-president, and A. B. Dabney, acting secretary, and the following directors: C. W. Dixen, Gamble & Stockton Co., Jacksonville, Fla.; W. D. Eddins, Salmen Brick & Lumber Co., Slidell, La.; J. M. Jenkins, Jr., Jenkins Brick & Lumber Co., Montgomery, Ala.; C. T. Thomasson, Bessemer Fire Brick Co., Ensley, Ala.; M. A. Ferst, Roper, Straus, Ferst Tile Co., Birmingham, Ala.

It all started early last spring when J. T. Howington, of the Coral Ridge Clay Products Co., Louisville, after having joined the National Hollow Tile Association, begun to realize the benefits of co-operative work. From realizing that benefits could be secured through co-operation, it was only a step to thinking about what good might be accomplished in the South if all the southern manufacturers could be gotten together in a southern association modeled after and co-operating with the national organization. After thinking over the matter and concluding it looked good, Howington got busy writing letters to southern tile manufacturers, which culminated in calling a meeting at Birmingham, April 18 and 19, where a preliminary organization was developed and committees were put to work to round up additional membership. Following this and keeping up the good work while the iron was hot, figuratively speaking, another meeting was held at Birmingham, June 20 and 21; that is, the directors of the organization held a meeting on the 20th, and a general meeting was held on the 21st, with an increased membership and promise of still additional members.

At this meeting considerable progress was made in perfecting plans outlined at the first gathering, and now the Southern Tile Association is getting in shape to do splendid, effective work.

The constitution and by-laws are modeled after those of the national association, and it was naturally the intention to work with the parent body in the broader things, and meantime to get close together in the southern territory, to boost the hollow tile game and to develop uniformity in sales propositions, service, etc.

In the matter of standardizing their work and developing uniformity this new Southern Tile Association is making splendid progress, and it seems to be even ahead of the national association, in that they have developed to a practical point uniform conditions governing selling proposals and contracts. This, of itself, is worth considerable, and it is a line of work that may well be taken up by other organizations, not only in hollow tile, but in the brick business, for the standardizing of conditions surrounding selling propositions and service and terms constitutes one step in industry that at the present time is imperative if we are to have anything like fair competition and fair profits. This matter of uniformity in contract proposals is comparable with standardization in the manufacturing industry itself in the way of creating efficiency and reducing the chance to err and for misunderstandings. Also it is one of the essentials to intelligent co-operation in the business of selling and handling contracts.

The Southern Tile Manufacturers have gone at this work of getting together enthusiastically, but not recklessly nor without due thought. They have given the matter careful consideration and from the very beginning took legal counsel, so that they might follow the law carefully while pursuing their own ideas for boosting the hollow tile game.

They called in consultation at the original gathering E. R. Sturtevant, secretary of the National Hollow Tile Association, and also had the counsel of Robert F. Vaughn, an attorney of Louisville, who discussed the present day industrial situation in its broader aspects at considerable length, and pointed out the development of co-operative competition, outlined the changes in practices and laws which have come as a result of progress toward a better understanding between business men and the government, especially through the aid of the Federal Trade Commission.

By having the good counsel of the secretary of the national association and of a competent attorney at the outset, the new southern organization has got itself started off in fine shape and has made excellent progress and appears to have a bright future before it.

PLANT MANAGEMENT

By Richard B. Hoehne.

Part V.

The Application of Mechanical Forces.

MECHANICAL FORCES in the sense of the classification adopted for this writing are often employed for purposes, which could be accomplished at much lower cost by utilizing natural force, while in other instances too great a benevolence towards hand labor prevents the application of machines where they would answer at much less cost and sometimes even more reliably than workmen. As a rule, mechanical forces are more expensive than natural forces, yet cheaper than the force obtained from workmen. If this principle were permitted to govern in the application of forces, it would save many million dollars annually.

A proper amount of intelligence used in plant management would suggest a careful survey of the situation, preceding a decision as to the class of force that would most efficiently achieve a certain end. It appears, however, that ordinarily the system is preferred, which requires the least amount of thinking and the smallest initial investment. For example: On a western face brick plant the clay-feeder for a dry-press had been accorded a somewhat isolated location on the floor above the press-room. This circumstance had correctly suggested to select a type of feeder that would work without requiring continuous attention, and it did work. The only trouble presented was that it run over once in a while, just about the same as any vessel would after it were filled to the top, and the discharge would be less than the flow coming in. Now the problem arose, how to fix the feeder so it would quit running over. Well, what could have been simpler and require less of an investment than to station a workman to watch the feeders? This had been promptly done with an expense of about two dollars per day. The favored employe had to do nothing else but look at the feeder and ring a bell for signaling the clay shoveler at the bin whenever a temporary slack was desired to avoid overflow at the feeder. Well, the man did that, and he did it good and promptly, except—when he had gone to sleep, then the feeder would run-over in spite of the attendant.

This system did not last with me beyond the extent of about one week. Realizing that an electric bell operated automatically by the feeder itself would suit better, I conveyed this idea to the blacksmith shop and after another three days had elapsed the feeder was in a perfect position to take care of itself, free of charge with but a total investment of less than fifteen dollars, which thus saved over fifty dollars in wages each month.

Old-Fashioned Methods.

In modern ways of brickmaking there prevails a tendency to confine the process to imperatively necessary procedures, thus avoiding all agencies of loss in time and money. The newest styles of clayworking machinery are developed with a view of facilitating this end, to reduce the cost of production. While formerly the preparation of the raw material required several days, and in many instances as many weeks, under ordinary conditions it now merely is a matter of minutes to win, prepare and form the clay. This achievement is due to greater technical perfection of the mechanical plant equipment.

It is quite feasible that clayworkers accustomed to the old methods looked upon the improved machines with skepticism and would accept them but tardily with sufficient cautionary measures to permit of falling back on the well-tried system if the "new scheme" wouldn't work. That way considerable money has been invested unnecessarily, and the adherence to the equipment so created runs up the cost of manufacture to endanger the ability of a plant to compete with modern concerns. Yet, this state of condition is noticeable on a number of older plants.

Some years ago my practice took me to one of the large face brick plants in the south. On this plant I found an elaborate system for curing clay aside of splendid other means for preparing the raw material. The clay and shale intended for face brick was first coarsely ground on a dry-pan, from where it was elevated to an immense height in order to be discharged into a vertical cylinder of about two feet in diameter, with revolving knives in it. This cylinder was charged with exhaust steam from the lower end, while the clay entering from top descended slowly to be caught in a dump-car at the bottom of the cylinder. This was not all of it, no—by far not. In addition there were eight large bins constructed of concrete; these were to receive the clay after it had passed the steaming cylinder. To this end a workman was given charge of the aforesaid dump-car, which he pushed from the "steamer" to the specified one of the eight clay containers to discharge it by dumping the car at the top of the bin. The clay was then retained in the bins until it was deemed suitable for brick.

As will be seen from the further explanation, this system apparently was designed with due consideration of southern labor conditions, for I reckon the clay would have had to stay in the bins had it not been for the willingness of southerners of the chocolate variety. The reader can well imagine what a dusty job it meant to load the dry clay inside the bin by shovel into dumpcars again. This work required four sturdy men. Subsequently the clay was hoisted up an incline to pass through another dry-pan whence it wandered to the press, to be made into brick.

After carefully studying the interesting process and its cost, I thought it worth while to find out first, what difference there would be in the brick, if the clay were conveyed directly from the first dry-pan to the second, thus excluding the entire curing system from taking part in the preparatory course. The brick so manufactured were sold along with the rest, and nobody ever noticed even a slight difference in their quality. Consequently it was positively demonstrated that the advantages seen in the cumbersome and costly process of clay-curing were but imaginary.

The abandonment of the curing process presented a weighty item to the pocketbook of that brick company, as may be seen from the fact that fully six workmen were eliminated from the pay-roll. The wages paid the men at an average of $1.75 per day amounted to

$$1.75\times 6\times 26=273.00 \text{ per month, or}$$
$$273\times 12=3276.00 \text{ dollars per year.}$$

These figures ought to cause a little search in some of the old-fashioned plants; there are thousands of other instances where out-of-date methods eat away the manufacturers well-earned profits, while these modern times demand their discard.

(To be continued.)

BRICK NEWS FROM MONUMENTAL CITY.

NEWS LIKE all things, is relative, and just at this strenuous time of war and the thousand incidents of catastrophe, there is little to note in the building line and brick business generally.

The brick business hangs largely upon the coal interests, which, by the way, appear to follow a particularly variable mood. The contracts between the coal men and the brick manufacturers are drawn, subject to change and that change favors the latter. Some of the brick manufacturers had advanced information and the first to learn, therefore, the first to heed, was the Baltimore Brick Company. This company was able to readjust labor conditions and with Mr. Griffith's steady hand at the wheel, the business has assumed its normal healthy condition. Prices are about the same, and if "Efficiency is the power of doing one's most and best, in the shortest time and easiest day to the satisfaction of all concerned"—then, let us take off our hats to Mr. Griffiths.

Mr. Higgins, representative here of the Hydraulic Press Brick Company, has enlisted in the army.

Mr. Ira Shay, formerly of the Philadelphia office of O. W. Ketcham, located here about one year ago, after twenty-four years' service in the former office. He spoke of spending much time here after the terrible Baltimore conflagration and it was at that time—that Mr. Ketcham opened the Baltimore office. Mr. Shay is a strong personality and with his wide-spread knowledge, can perhaps, do very well without our good wishes—yet we gladly give them—all the same.

The Southern Hotel, Light & German Ltd. is a larger order —300,000 Kittanning face brick. This is a $750,000 job and the hotel calls for one million dollars for building and equipment. St. Peters school—Hollins & Poppleson Ltd.—$170,000 job calls for face brick and terra cotta and H. Mary's Star of the Lea—Giddings street and Battery avenue, face brick. O. W. Ketchum usually captures anything worth while and reports orders as follows:

High school, Berkeley Springs, West Va., architectural terra cotta.

Junior building, St. Mary's college, Emmetsburg, Md., fireproofers tile.

Calvert Bank, N. W. Branch, Baltimore, Md., architectural terra cotta.

Eisenberg warehouse, Baltimore, Md., $30,000, architectural terra cotta.

Among the contracts for future erection are five hundred and twenty-three two-story houses at St. Helena, Md., hollow tile.

A large addition to Bancroft Hall, Naval Academy, Annapolis, Md. This is a $2,700,000 property and will be built of brick, stone, terra cotta, hollow tile fireproofing.

The postoffice at Cambridge, Md., calls for brick, stone and fireproofing.

The cork grinder house for the Crown Cork & Seal Company calls for brick and steel—$50,000.

Store and residence restaurant, 101-103 E. Lombard street, Baltimore—$10,000.

Palace Theatre, Gay & Hoffman Addition, brick—$20,000.

Office building Baltimore Dry Dock & Shipbuilding Company—$110,000.

M. E. L.

DIGGING POLE HOLES WITH DYNAMITE.

THE DIGGING OF POLE HOLES with dynamite is a comparatively new practice, but it is fast supplanting the old-fashioned, tedious, and costly hand work. This new method has been found to be so practical and economical that it is fast being adopted by companies and contractors in this line of work.

The First Step in Digging Pole Holes with Dynamite.

When dynamite is used, a smaller number of laborers is required, and in these days of labor shortage, this fact is most pertinent. Another advantage, not to be overlooked, in connection with the use of dynamite and hand digging, is that the force of the explosion tends to pack the dirt (if wet) solidly around the walls of the hole, making a much firmer hole than possible to do by hand digging. In hard digging, where hand work is employed, the tendency is to make the holes shallow, which is quite natural, but in using explosives this danger is completely eliminated.

In the digging of pole holes for rural telephone lines, telephone lines from neighbor to neighbor, or from farm home to tenant home, dynamite will be found most useful, as farmers, as a rule, have not the necessary tools on hand to put down a pole hole by hand to good advantage. By using dynamite to perform this service, a long-handled shovel, punch bar and sledge or soil auger are the only tools necessary and these can be supplied with little trouble.

The operation of digging the pole hole with dynamite is a simple one. After the location of the hole has been decided, a hole from 6 to 10 inches deep, the full diameter of the hole required, is dug with a shovel. This is to relieve the pressure and to prevent excessive shattering. The sides of this shallow hole should be trimmed straight and clean.

In the center of this shallow hole a bore hole is then put down to within from 4 to 6 inches of the depth of the desired hole. This can be done easily with punch bar and auger—the punch bar to start the hole and the auger to finish it.

It is necessary to place dynamite in this bore hole at intervals of from 6 to 24 inches, according to the hardness of the soil and required diameter of the hole. The spacing of the dynamite can best be accomplished by the use of a lath or light stick. The charge intended for the bottom one is tied to the end of the lath, and the other charges, consisting of a piece of a cartridge up to a whole cartridge, are tied to the lath at the required intervals.

The top cartridge, or piece of cartridge, is primed with a No. 6 blasting cap and fuse or an electric blasting cap. This primer is tied on the lath so when placed in the bore hole it is from 18 to 24 inches below the surface of the soil.

The lath with dynamite attached is lowered into the bore hole and the primed cartridge, of course, is placed up. As the shock caused by the explosion of the primer detonates the other charges, care should be taken to see that no dirt, stones or clods fall between the charges. A light tamping of the bore hole generally gives best results, but here again care should be taken to see that no tamping material falls below the primer. If the hole is filled with water, no tamping is necessary.

Lath with Dynamite Attached Ready to be Lowered Into Hole.

The force of the explosion should throw out considerable dirt and loosen the remaining so that it may be readily cleaned out with the shovel in two or three minutes.

No definite rule can be laid down as to the amount of dynamite required or as to the spacings, due to the fact of the varying soil conditions, different depths and diameters of holes required. The only way is to make test shots to see what best suits the local conditions.

Among reports received on work of this sort is one on blasting a hole 4½ feet deep in a hard clay soil. In the hole was placed five quarter cartridges of 60 per cent. straight dynamite. These were distributed about 6 inches apart, beginning at the bottom, and the hole was left untamped. The results were excellent, as a hole uniform in size at top and bottom was dug and the dirt well blown out, requiring but little handwork to finish. As has been mentioned, no set rule can be laid down, but the results of this blast might serve as a basis for trial shots.

If dynamite will do the same amount of work with a less number of men, or a greater amount of work with the same number of men at a reduced cost, isn't it worth employing?

Written for THE CLAY-WORKER.

MILWAUKEE AND WISCONSIN BRICK AND BUILDING NEWS.

BRICK IS DECIDEDLY the most naturally adaptable building material on the construction market of the world, all points considered—portability, resistance, and appearance. Furthermore, contractors in Wisconsin are beginning to look upon brick as the real original joy producer, for while representatives of nearly all lines of building material are warning and cautioning with trepidant premeditation of a continued increase in cost of their various lines, the brick market continues along the same normal level, its product serving more people than ever in more diversified ways.

Cities that never before used brick in their paving operations and other cities that never had any paving at all are today making an almost insatiable demand on the kilns of the state. Cities during the last few months, after consulting with their engineers, have decided on brick and after the bids were received paving expenses proved to be as low as, and in some cases lower than, paving done in time of proportionately lower price lists in general.

In fire and face brick "steady" is the market vernacular to describe the situation in which that commodity reposes.

"For some time at least, there will be no increase in building brick," recently said F. G. Mority, sales manager of the Milwaukee Building Supply Company. "Brick has been holding its own all the time in amount of demand, and although we might have more orders we could not possibly handle them under present traffic conditions."

Business is fine, according to every brick man in the state, and brick is enjoying continued popularity with nothing in the future but more prosperity.

Not a moss-grown slab of decaying granite, but real tall and majestic brick buildings dominating the downtown business section of Milwaukee stand as monuments to the memory of Henry Ferge, master builder, who died recently at his home in Milwaukee at the age of sixty-four years, following an illness of several weeks.

Mr. Ferge was one of the most prominent builders in the United States. He originated and promoted the Milwaukee Builders' Exchange and was its first president. He erected the city hall, the library, the Wells building, the Sentinel building, the Auditorium, the Milwaukee hospital and many other large buildings in Milwaukee. He is survived by a widow, two sons, and two daughters.

Zerrenner Brothers, of New London, are turning out 30,000 building bricks daily in compliance with orders from all parts of the state. A short time ago a new tower and water tank with 6,000-gallon capacity was erected and a complete fire fighting system installed. It has been said that the success of any business is contingent on personal supervision. In the case of Zerrenner Brothers one has a definite example of that fact. All the burning is done by Albert and Otto Zerrenner. To burn the kiln-ful requires from nine to twelve 24-hour days. A constant vigil is necessary, the brothers taking twelve-hour shifts.

Zerrenner Brothers moved their plant from Kewaunee to New London in 1897.

Erler & Weiss, West Bend, have sold their tile and sewer pipe business to the West Bend Lumber Company, of that city, and will devote their time entirely to the monument industry.

The Hydraulic Press Brick Company, Menominie, will furnish more than 225,000 brick for the walls and tower of the new St. Johns Catholic church building on North First Street, Glenwood City. The facing brick will be of a tan shade, set in a chocolate-colored mortar.

The Barron brick yard, Barron, again has begun operations with prospects of a good season. The Barron yard is one of the substantial institutions of the city.

The brick plant of Thomas Larson, at Shawano, is operating away behind orders. His entire stock was sold out last fall, and since that time has been unable to create a surplus for storage purposes.

Building men are pleased with Milwaukee construction figures compiled for May, 1917, and showing aggregate building permits of $1,263,870.

A. BADGER.

CONSERVE STEEL BY PROMOTING BRICK BUILDING.

PERTINENT SUGGESTIONS TO WASHINGTON OFFICIALS—BRICK AND TILE THE LOGICAL MATERIAL FOR PRESENT BUILDING REQUIREMENTS

THERE IS BEFORE US RIGHT NOW a chance for the members of the clayworking industry to do their bit in a patriotic way and at the same time improve business in the industry. The chance in promoting the use of brick and hollow tile for building operations and conserving much of the steel that has been going into structural work for war needs. This can be accomplished through featuring mill construction—the use of brick walls and piers and wooden posts and beams. Brick and hollow tile are readily available, and are not needed for war purposes, and wood, while being extensively used and higher in price, is still available in the quantities required by this form of construction.

The matter of advocating mill construction—the use of brick and timber to conserve steel—is made particularly important right now by the urgent needs of the government for all the steel resources available. Some idea of the stress in the steel situation may be had from the fact that the government has placed an embargo on the export of pig iron, steel billets, structural shapes and even scrap iron and steel, along with the embargo on food stuff and coal, and the railroads have issued instructions against receiving such items for export shipment except when federal permit is furnished.

Brick and Tile Overlooked at Washington.

The Chamber of Commerce of the United States, taking note of the situation, issues a bulletin in which it advocates the use of concrete to conserve steel. This bulletin follows:

War Bulletin No. 2.

CHAMBER OF COMMERCE OF THE UNITED STATES OF AMERICA

Riggs Building, Washington, D. C.

Iron and Steel.

The authorities of the Council of National Defense believe that the iron and steel situation should be understood by every business man in the country. It can be set forth in a few words, but directly or indirectly it affects all business. Business policy everywhere should be developed with full regard to this fundamental condition.

War Requirements.

The requirements of iron and steel in the prosecution of the war can hardly be exaggerated. Figures cannot be given, but the broad statement can be made that the utmost which can be produced is below the requirements of the United States government and its allies and of business closely related to the war. This condition will continue; for, on the one hand, no substantial increase in production is anticipated; in fact, every maximum production from existing facilities cannot be expected, because transportation, labor and material conditions will interfere with the full operation of plants, and, on the other hand, indications are that the war requirements will continue to increase.

Uses in War.

The direct requirements of the government for pig iron are relatively small, but the requirements for steel are enormous and iron is therefore required in corresponding quantities. Steel is needed in the war for ships, railroad cars and locomotives, rails, trucks, containers, etc. Furthermore, there are the requirements for shells and other munitions work, requirements large in tonnage, far beyond what is generally supposed. In addition, business closely related to war, i. e., business producing government materials and supplies, the necessities of life and the materials for producing the necessities of life, require steel in great quantities for buildings, machinery, tools, containers, etc. When all these requirements are met, little, if any, steel will be left for so-called general business.

Supply of Other Materials.

With no other metal is the condition as disturbing as with iron and steel. Even the supply of copper is not nearly so inadequate. Materials which can be used in substitution for steel are plentiful in comparison. Lumber may be expected to meet all requirements and cement may be had in quantity for concrete work. While there may be delays in these cases, a hopeless shortage does not exist.

Substitutions for Steel.

The course for business men to pursue is clear. Iron and steel should be used only when the requirement is unavoidable. Every effort should be made to use wood and concrete in place of steel whenever this can be done, and construction and development work requiring steel should be postponed wherever possible.

Course for Ordinary Business.

Where a business uses steel as a raw material and the product is not used in connection with the war, conservative men will now plan to use some substitute, and if this cannot be done, they will doubtless plan to curtail or even to suspend operations during the war. It should be anticipated that the situation which is developing with rapidity will probably make it impossible for them to secure adequate supplies of steel and may even make it impossible to secure any supply.

Outstanding Contracts.

Apparently little will be gained by contracting ahead for steel. Experience today indicates that soon producers of steel must ship their product where required in connection with the war, rather than on such contracts as they may have on their order books. When the production of railroad cars and locomotives is interfered with because necessary steel is going to industries producing pleasure automobiles, steel furniture, buildings for amusement purposes, etc., the situation cannot be expected to continue.

Priority in Distribution.

Business men will probably make their plans in the expectation that soon there will be established an order of distribution of steel, and that the wild scramble to enter orders for future delivery of steel will be ineffective. In fact, it will occur to many, no doubt, that failure to recognize this situation may lead to unfortunate results. In a business requiring steel, if contracts are placed for future delivery, not only for steel, but for other materials, the manufacturer may find that he cannot get the steel but can get the other materials. In this case, he might find that he had on hand large quantities of materials which he could not use because he had no steel.

Attest: ELLIOT H. GOODWIN, General Secretary.

Brickmakers Can and Should Do Their Bit.

We might well turn aside here and dwell at some length on the point that brick might have been included in this mention if it had heretofore been as widely exploited as cement and kept as persistently in the public mind, but the more important and immediate need right now is to be found in what we can and may do to promote the use of brick in building operations, and thus serve the three-fold purpose of conserving steel right now when it is urgently needed in war lines, encouraging a normal resumption of building operations, which are somewhat depressed at the time, and promoting the interest of the clayworking industry. Surely, here is a three-fold reason that ought to arouse into action every clayworker in the country. It is a chance for us to do our bit—and benefit from it. So, let us set about it.

That live-wire bunch which controls the American Clay Machinery Co., and which is always to be found at the front, boosting for the clay products, has already been in action with its big guns trained on the situation. President R. C. Penfield set the wires to buzzing from Washington immediately after the Chamber of Commerce bulletin came out, arousing the home office and other offices of the company, and putting F. L. Hopley, their advertising man, into action. Mr. Penfield pointed out in his telegrams that concrete to be useful in building operations generally requires lots of iron and steel for reinforcement. Brick masonry and mill construction, he says, is the proper solution. Before the advent of steel and the use of reinforced concrete, brick masonry and mill construction constituted the standard construction. And, he might well have added that it is still a good standard.

A Timely Boost for Brick and Tile.

Mr. Penfield advises taking the matter up with architects and getting their co-operation, which should be very acceptable all around, for the architects are very much concerned right now with the problem of how to keep the building business of the country going. In this connection, Mr. Hopley advises us that their Chicago office took the matter up with the architects there, and at their meeting on the eleventh, the architects heartily endorsed the proposition of eliminating steel as far as possible in structural work during the war period.

That is good work, which will meet with hearty commendation, and now the question is, what can you, we, and the other fellow do as our bit in the occasion? See the architects, is one of the first thoughts that comes to mind in this connection. There should be a getting-together of architects and builders everywhere—not some time, but right away. There is need to boost the building business, which has been dragging sadly since we entered the war, and here is a way opened to do it effectively.

And finally, let every man in the business put to work all the publicity and boosting machinery available to help the cause. Brick has always performed an important mission in the building industry, but there has never been a time in this country heretofore with such a big opportunity to come to the front conspicuously. Let us seize the opportunity and get busy with it.

GARAGE BUILDINGS.

If the signs read right we are in the dawn of an era in which garage buildings will not only constitute an important item, but the building of garages will become also an important consideration in the pushing of brick for building operations.

There is an agitation already under way for fireproof garages, that is, building inspectors in the cities are beginning to have the realization brought home to them that even for residences outside the fire limits it is becoming imperative to have the garages fireproof for the safety and welfare of the community. Fire marshals have been investigating the subject, and realizing the fire hazard, they are also having to face the proposition of housing automobiles and trucks in absolutely fireproof structures.

In all of the larger cities there are what is known as fire zones, where such structures must be fireproof. Outside of these zones, however, it has been the practice heretofore to permit the building of any kind of a shed in which to house the machine or truck. Now there is an awakening to the danger of this and some building inspectors are already issuing orders that even residence garages must be either fireproof or what is known as slow burning construction.

There is going to be a fight over this, if the signs do not read wrong. The lumber people are going to contest the progress of this idea, while on the other hand the metal people will be boosting for it. Meantime it is up to the brick people to get into this game and show where and how in there is economy as well as safety in building with brick.

When it comes to fireproofing there is admittedly no other building material that will compare with it. Therefore when it becomes necessary as it evidently will soon, to build fireproof garages everywhere, even on the farm as well as at the suburban home, there is economy as well as safety in building with brick. To state it another way, brick is cheapest in the end as well as best, all of which makes a splendid opening for the boosting of brick and other clay products strongly for garage building.

OBITUARY.

Death of P. L. Simpson, a Pioneer Inventor of Clayworking Machinery.

A LITTLE MORE THAN a decade ago one of the best known men in the clay machinery business of America was P. L. Simpson, the inventor of the dry press brick machine bearing his name. He made and introduced other clay machinery, much of which is still in use in the clay plants of the country. Mr. Simpson was born in Boness, Scotland, December 21, 1848, and died at his home in Chicago, July 11. For many years he was a regular attendant at all N. B. M. A. conventions, and never lost interest in the work of that organization. He served an apprenticeship as a foundryman in the Bathgate Foundry, at Bathgate, Scotland. He came to America in 1870, and became a resident of Toronto, Canada, where he married Jeanette A. Teasdale, of Airdrie, Scotland. In 1875 he moved to Cleveland, and some ten years later became a resident of Chicago, where he has lived ever since. In 1903 his business was consolidated with that of the American Clay Machinery Company. Of late years Mr. Simpson had been an enthusiastic golfer and a devotee of literature and music. In the death of Mr. Simpson the clay trade lost a really true and genuine friend.

The Late P. L. Simpson.

THE MODEL SMALL CAPACITY PLANT OF THE BUFFALO CLAY CO., STATESVILLE, N. C.

STATESVILLE, WHICH is the center of things in North Carolina, has a new face brick plant in which the people of that thrifty community take much pride, not because it is a big capacity plant, but rather because it is a model of modern equipment and produces an excellent grade of face brick at comparatively low cost. The culls of the plant are sold chiefly for home consumption as common, but the quality of face brick made is so excellent that they are growing in favor with architects throughout the state.

The brick are a very dark brownish red and lay up in the wall in either dark or light mortar with beautiful effect. They are impervious to moisture, a feature that is more appreciated now by builders than in former years.

The plant is located some ten miles up the Catawba river, where there is a large supply of fine surface clay, which no doubt was washed down from the hills and mountains in centuries gone by. The deposit ranges from 15 to 30 feet in depth and there are many acres of it. A switch from the Southern railroad affords excellent shipping facilities. The method of gathering the clay is rather unusual. It is gathered in a scoop shovel holding about half a yard of clay and drawn by a cable several hundred feet in length to an elevated platform, through which it is dropped into side-dump cars, which in turn are hauled to the plant by cable, which is operated by friction drum. The whole operation is simple and requires but little manual labor.

FACE BRICK PLANT OF THE BUFFALO CLAY COMPANY ON

From the car the clay goes into an Even clay feeder, which mixes two different kinds of clay in any desired proportion. It is well named, for it feeds the clay evenly into a disintegrator, thence into a pug mill, which feeds it into a No. 3 Steele machine with a daily capacity of 30,000 brick, on which they can make either an end or side cut brick, as may be desired.

At the time of our visit a Steele Automatic Rotary end cut cutter was in operation, and it certainly did the work to perfection. From the machine the brick are carried on double-deck iron dry cars to a waste heat tunnel dryer. There are six tunnels, each holding fifteen cars. The heat is drawn through underground flues, two large fans being used in the process, one forcing the hot air into the dryer and the other to carry the draft from the burning kilns. The process has proven economical and satisfactory in every way.

The process of drying and burning requires, all told, about six days. As a rule, the brick go from the kiln direct to the freight car. In this part of the work they use a Mathews Gravity Carrier with decided advantage. It is a great labor saver.

The entire plant is designed and operated with a view of saving labor in any and every way possible. They burn in round down-draft kilns, which gives them a very large per cent of face brick and no soft brick at all.

AN UNUSUAL AND AN UNFORTUNATE EXPERIENCE

The plant was first erected early in 1916 near the river, but at a point that was supposed to be well above high water mark. Just as it was about completed, the unprecedented floods of that year occurred and the entire factory—building, machinery and all—were washed away, some of the heavy machinery even being carried quite a distance down the stream, where it was found afterwards buried in the sand and silt.

This was indeed a bit of hard luck, but all undaunted, the secretary and manager, Mr. E. R. Rankin, gathered up the machinery and such portions of the factory as could be recovered and rebuilt on higher ground, where he feels that he is now safe from further flood troubles, and counts confidently on operating the plant to capacity the year around for many years to come. Certainly the high quality of the brick being made is of itself ample justification for Mr. Rankin's faith.

AN ICELESS REFRIGERATOR.

During our stay in North Carolina, we were impressed with the fact that it was a bone-dry state. There is an absence of groggeries and a general air of thrift and tidiness which is both impressive and pleasing. The summer in that state is rather long and warm, so that cooling drinks are desirable for one's personal comfort. It is difficult to get or keep ice at a brick plant, so the resourceful superintendent has solved the problem at the plant by rigging up an "iceless refrigerator." A dry well is located beneath one corner of the factory office and a dummy waiter or hoist has been rigged up by which a couple of dozen bottles of Coca Cola or any similar soft beverage may be kept in stock and at a temperature that makes it a very pleasing and palatable drink. Needless to say, this home-made refrigerator is kept under lock and key. We sampled the contents thereof after the trip through the plant, and found the "soft drink" a much better thirst quencher than the ordinary glass of ice water. The dry well is 14 feet deep and is lined with 12-inch sewer pipe. The lift is operated by a hand windlass, after the fashion of the old oaken bucket.

WITH J. C. STEELE & SONS.

The entire mechanical equipment of the Buffalo Clay Company's plant was furnished by J. C. Steele & Sons, Statesville, a firm that needs no introduction to southern clayworkers, with whom the Steele simplified brick and tile machinery has proven very popular. Not only is the Steele machinery popular in the South, but of late years they have extended their trade into the northern states as well. Just recently they have supplied the complete equipment for a 100,000 per day brick plant in Pennsylvania, and are supplying brick machinery, cutting tables, etc., for other plants in that and adjoining states. As will be seen by their ad on page 98 of this issue, they are now represented in the North by the Manufacturers' Equipment Co., Dayton, Ohio.

Their foundry and machine shops are equipped with every modern device and facility for the manufacture of clayworking machinery of all sorts, including cutting tables for both end and side cut brick, dryer cars, clay cars, etc. They operate a small brick plant, which is located just across the street from their shops, where a good grade of building brick is made for the local market. This affords them an opportunity for testing out their clay machinery in a most effective way. Visitors to Statesville who are interested can see not only how brick are made, but how the machinery is made with which the brick are made. It is a fine working organization, the chief element of which is good horse sense, a talent not nearly so common as it is supposed to be.

THE CATAWBA RIVER, TEN MILES FROM STATESVILLE, N. C.

CONSTRUCTION MATERIAL IN CUBA.

That little island republic of Cuba is one of the great shining examples of the benefits which come from assisting other countries in the matter of self-government and progress on the part of the United States. That country has made more progress during the few years under the guidance and counsel of the United States than it made in all history before that, and is today one of the most prosperous countries of the world.

This prosperity has resulted in extensive building operations and new plans being made at the present time which are of interest both to brick people and to brick machinery people. Special Agent W. W. Ewing, of the Bureau of Foreign and Domestic Commerce, is author of a recently issued special bulletin on the market for construction material and machinery in Cuba. It is listed as Special Agents' Series No. 139, and may be secured for 10 cents from the Bureau of Foreign and Domestic Commerce at Washington.

He says, among other things, that there are extensive plans for new sugar mills, railways, dock facilities, hotels and homes.

The sugar mills mean more fire brick business and the fire brick people are mighty busy people, anyway. The thing of particular interest, however, is the possibility of developing a more extensive trade in building brick and in hollow tile. In fact, there seems to be two openings here, one for the sale and shipment of building material and clay products from the United States, and the other for the sale of brick making machinery in Cuba for the development of local industries in the making of better building material.

Cuba has plainly reached the point now where the old thatched hut is to be replaced with modern buildings, and it is ripe for its share of those "Build With Brick" signs. We generally regard the brick business as a domestic business, so far as building brick is concerned, but this is a near-by export trade which looks like it holds healthy possibilities for face brick and hollow tile, and for the clay machinery chinery people also to do some good mission work.

PLANS ARE PERFECTED FOR EXTENSIVE COMMUNITY BUILDING IN CLEVELAND.

Fire Safe Homes to be Erected for Men of Moderate Means in Various Sections of the State.

The Homesuite Home Company has been incorporated at Cleveland, Ohio, for the purpose of building on a large scale fire-safe homes of moderate cost. The plan was conceived by Robert C. Mitchell, until recently the sales manager of the Barkwill-Farr Brick Co. He has severed his connection with that company in order to be able to devote his time to the new enterprise which, it is hoped, will result in many workingmen owning their own homes who otherwise would be renters. The idea is to build in various parts of the city a number of groups of dwellings, each to have modern conveniences and to be sold on terms that men of average means can purchase, and become householders.

Mr. Mitchell states that options have been taken on one hundred lots and the work of building the first one hundred homes will be commenced in the very near future. The initial venture of the company will represent an expenditure of $450,000. The average price per home will be about $4,500, including the lot.

ANNUAL MEETING AMERICAN SOCIETY FOR TESTING MATERIALS.

AS USUAL, the twentieth annual meeting of the American Society for Testing Materials was held in Atlantic City the last week in June, and, as usual, there was a large attendance, contrary to expectation, for it was anticipated that the strenuous conditions and detractions incident to the war would keep many of the delegates from participation. This was true in a measure. Quite a number of those who have played leading parts in the work of the society in former years were conspicuous by their absence, among them Prof. Orton, chairman of Committee C-3, was obliged to send regrets, owing to the fact that he is now in military service in Texas.

The program included the usual number of able papers and committee reports dealing with the standardization of various structural materials. Among these were:

The report of Committee C-4 on Clay and Cement Pipe, by Chairman Rudolph Hering.

Committee C-6, Drain Tile, Chairman, Prof. A. Marston.

Albert V. Bleininger at Ease on the Garden Pier.

The Failure of 30-in. Tile Drain at Albert Lee, Minn., by R. W. Crum.

Committee C-8, Refractories, Prof. A. V. Bleininger, chairman.

Suggested Improvements in the Manufacture of Silica Brick, C. E. Nesbit and M. L. Bell.

Committee C-10, On Hollow Building Tile, L. H. Provine, chairman.

In due time these reports and papers will be released for publication, when we will reprint them for the benefit of The Clay-Worker readers.

Prof. Orton was represented by his colleague, Mr. Ellsworth Ogden, under whose direction the testing work for Committee C-3 is being continued. It is anticipated that a final report will be made at the next yearly meeting.

Being an all-round resort, Atlantic City is always attractive, but is is especially so in midsummer when surf bathing is the chief attraction. The board walk and its varied amusements is a veritable panorama of human interest. The great piers are always a center of interest and the most attractive of them is the Garden Pier, which is notable for the color scheme of the pagodas and the main buildings, which are decorated with mosaic tile, designed and produced by Herman Mueller, of the Mueller Mosaic Co., of Trenton, N. J. It is the one restful spot on the board walk, being free from the blare of trumpets and the noise of jollifications of the Steeple Chase and other similar resorts. The Garden Pier is especially attractive to clayworkers, particularly those who take pride in the art side of the industry. The accompanying illustrations give but a faint idea of its architectural beauty. Its red tile roofs is a beacon that may be seen from afar off, and the quaint wall decorations in browns, buffs, yellows and blues delight the eye of even the critical observer. We are pleased to reproduce a snap shot of Prof. Albert Bleininger on the Garden Pier, in a state of rest, a rarity for him, his normal state being one of excessive activity. In truth, he is a livng example of the definition of genius, namely, a great capacity for work. His untiring, unceasing efforts for the promotion of the ceramic industries entitle him to an enduring monument in everlasting clay.

MIDYEAR MEETING NEW JERSEY CLAYWORKERS.

THE CLAYWORKERS of New Jersey held their summer meeting in the auditorium of the Industrial Art School at Trenton June 29. There was the usual attendance of seventy or more, including several distinguished visitors who came to fill the places assigned them on the program. The formal papers were:

Approach to Garden Pier Showing Tile Decoration.

"American Pottery Materials," by George H. Brown, Rutgers College, New Brunswick, N. J.

"Preparation of Glazes and Enamels," by Prof. J. B. Shaw, New York State School of Clayworking and Ceramics, Alfred, N. Y.

"Notes on the Cracking of Terre Cotta Bodies," by E. C. Hill, the New York Architectural Terra Cotta Co., Long Island City, N. Y.

"Clays for Slabs and Saggers," by R. C. Purdy and M. F. Beecher, Research Laboratories, Norton Co., Worcester, Mass.

"The Mechanics of Ceramic Engineering; Dryers and Kilns," by L. E. Barringer, General Electric Co., Schenectady, N. Y.

"Some Recent Problems in Ceramics," by A. V. Bleininger, Bureau of Standards, Pittsburgh, Pa.

"Chemical Stoneware," Fred. A. Whitaker, General Ceramics Co., Keasby, N. J.

Interspersed with these papers were a series of shop talks and in the evening there was a dinner party at the Trenton Country Club, which proved very enjoyable. August Staudt, president of the Perth Amboy Tile Company, presided, having recently been elected to the presidency of the Association to fill the vacancy caused by the resignation of Howard Valentine. As announced in the June Clay-Worker. Mr. Valentine was incapacitated by poor health.

It was decided to hold the next regular meeting the first week in February, 1918. There will be a special meeting in December to meet the constitutional requirement, when the program committee will be announced and other matters of interest to members now in the hands of committees will be determined.

THE AUTOMOBILE AND ROAD BUILDING.

IN 1916 there were 3,513,000 automobiles and 251,000 motorcycles registered in this country, according to the U. S. Office of Public Roads. The revenue they yielded in the form of licenses and registration fees was $25,865,000. The revenue had increased 42 per cent. over that for 1915 and the number of cars and motorcycles had increased 43 per cent. About 92 per cent. of the revenue was spent on road improvement of some kind. The use of the cars is shown by the population per car in the different states. The great agricultural state of Iowa stands first, with a car for every eleven persons, and then follow California with twelve persons to each car, Nebraska and South Dakota with thirteen, Kansas with sixteen, Montana and North Dakota with eighteen, Michigan with nineteen, and Indiana and Ohio with twenty. These are all agricultural states, and it is certain, not only from these statistics, but also from common knowledge, that the automobile has become a valuable part of the farmer's equipment. It is not the great manufacturing states, like New York, with a car to every fifty inhabitants, or Pennsylvania, with a car to every thirty-seven, that show the highest popular use of the motor vehicle. The fact is, the farmer, like the rancher in Arizona, where there is a car for every twenty-one persons, finds the automobile invaluable in overcoming the isolation of country life, and he is now willing to concede that good roads, which will enable him to use his car at any time in the year, are a necessity. Instead of complaining that good roads are only desired by the automobilist, he wishes them built so he can get the most benefit from his ownership of a car.

On the Board Walk, Atlantic City.

POTTERY PRODUCTS SHOW INCREASE.

The pottery industry showed a large gain in 1916, compared with 1915, the output of the potteries of the United States being valued at $48,217,242, an increase of $10,891,854, or nearly 30 per cent., according to a report soon to be issued by the United States Geological Survey. This value is the largest yet recorded, being $10,224,867 greater than that of 1913, the preceding year of greatest value.

In 1916 every variety of pottery as classified by the Geological Survey increased in value. Sanitary ware showed the largest increase. China showed nearly 50 per cent. increase.

The value of white ware, including china, which comprises the general household wares and constitutes nearly 50 per cent. of all pottery products, was $21,669,762 in 1916, an increase of $4,015,364 over 1915.

Though the large increase in the value of the higher grades of pottery was due, at least in part, to the increase in the selling price at the works, caused by the increased cost of raw materials and labor, yet the volume of business was probably the largest ever done by American potters, notwithstanding the adverse conditions of labor and transportation, which materially lessened the output and delivery of wares.

A Small Section of the Garden Pier.

Pottery was made in thirty-seven states, the value of the wares ranging from $19,441,533 in Ohio to a few hundred dollars in Puerto Rico. Ohio's pottery products increased in value $3,511,754, and constituted 40 per cent. of the value of the output of the entire country. Its principal product is white ware, valued at $11,834,913, or 61 per cent. of the value of the state's entire pottery output and nearly two-thirds of the value of the output of white ware in the entire country. New Jersey is the second largest pottery producing state, its pottery wares marketed being valued at $11,064,878, and constituted 23 per cent. of the product of the country.

West Virginia is third in rank among the pottery producing states, its marketed pottery wares being valued at $5,780,853, an increase of $1,270,230 over 1915. Its principal product is white ware, valued at $3,576,510.

The value of imports of pottery was $5,600,585, a decrease of $1,027,501. The value of the exports was approximately $1,076,572, an increase of $513,120, or more than 90 per cent. The imports consist almost entirely of high-grade ware, 95 per cent. being of that kind.

The value of the pottery imported into the United States in 1916 added to that of the pottery produced makes a total of $53,817,827. After deducting from this sum the value of the exports of domestic ware, $1,076,572, and of the re-exports of foreign ware, $81,223, the value of the apparent net consumption is $52,660,032, of which the domestic production was 92 per cent., by far the highest proportion yet reached.

BRICKWORK TESTS AND FORMULAS FOR CALCULATION

BY H. KREUGER, PROFESSOR AT THE TECHNICAL HIGH SCHOOL IN STOCKHOLM

Translated for The Clay-Worker by G. Wson Cronquist.

THE STRENGTH OF BRICKWORK chiefly depends on the quality of the brick and the mortar, principally, however, on the compressive strength of the brick. Furthermore, the quality of the mortar, the sizes of the brick, the thickness of the joints, the unequality of the surfaces of the brick, age and temperature are of great importance.

In the following I am going to give a report on some of the circumstances influencing on the strength on the basis of the results of experiments connected therewith.

In order to settle the influence of the above mentioned circumstances, the specimens must be of such a quality that the influence on different occasions will clearly appear. Thus you cannot, from a specimen of brickwork of equal height and breadth, know the influence of the thickness of the joints, as well as you cannot know the influence of the quality of the mortar. Also, you cannot, from small brickwork specimens with only a few brick, find out the average compressive strength, as in a delivery of brick the compressive strength is very much varying in the different brick.

On account of a number of preliminary experiments, I inferred that pillars being three to three and one-half times as high as wide, are most advantageous for finding out the above mentioned influences. Therefore, in my experiments, I used brickwork specimens of square section and of a height of about 3.3 times the width, and I used the indication "normal pillars" for such specimens.

In the preliminary series of experiments mentioned here below, I have stated only the most important results; the conclusions, however, are deduced from all the experiments made. At all brickwork specimens, the upper and lower surfaces were made smooth by means of cement.

Influence of the Strength of Brick.

Indication	Proportion Between Height and Width of the Pillars h:b	Average of Compressive Strength of Bricks in kg/cm² k_z	Compressive Strength of of Brickwork in kg/cm² k_m	Average %	Strength of Brickwork Computed in Per Cent of the Strength of Min. Max. %
I D_7 a......)			26)		
I D_7 a......)	86		26)		
I D_7 a......)	—=3.45	135	30) 28.8	21.3	19.3—23.7
I D_7 a......)	25		30)		
I D_7 a......)			32)		
I D_3 a......)	86		42)		
I D_3 a......)	—=3.5	177	46) 47	26.5	23.7—29.5
I D_3 a......)	24.5		48)		
I D_3 a......)			52)		
I D_2 a......)	84		57)		
I D_2 a......)	—=3.5	284	59) 62	21.8	20.0—24.3
I D_2 a......)	24		69)		
I D_6 a......)			56)		
I D_6 a......)	85		65)		
I D_6 a......)	—=3.48	373	69) 68.8	18.5	15.0—21.2
I D_6 a......)	24.4		75)		
I D_6 a......)			79)		
I D_4 a......)	79		124)		
I D_4 a......)	—=3.3	502	124) 128	25.5	24.7—26.2
I D_4 a......)	24		132)		
I D_4 a......)			132)		
I D_5 a......)			106)		
I D_5 a......)	78		111)		
I D_5 a......)	22.5		123)		
I D_5 a......)	—=3.5	606	118) 118	19.5	17.5—21.6
I D_5 a......)			131)		

In order to examine what influence the compressive strength of brick has upon the compressive strength of the brickwork, "normal pillars" were made of brick with the compressive strength varying from 135 to 606 kg/cm² and of lime-mortar in joints with constant thickness of about 10 or 12 millimeters. All the specimens, thus, were practically as equal as possible, except the different compressive strengths of the brick

The compressive strength of the pillars will appear from the following statement:

Series 1.

Size of the brick, 250x120x165 millimeters. Thickness of joints = 10-12 millimeters. Mortar of lime and sand in proportion 1:3. Eleven layers per meter in height. Age of the specimens at the experiment, 28 days.

From this it appears that the strength of the brickwork varies from 18.5 to 26.5 per cent. of the strength of the bricks. In Fig. 1 the results of the experiments are shown graphically. The compressive strength of the bricks are shown as abscisses and the corresponding strength of the brickwork are shown as ordinate.

The dotted lines show the average strengths of the brickwork at different compressive strengths of the bricks. The stroked and dotted lines show the maximum and minimum strength of the brickwork, according to the series of experiments, and the full line is a theoretically assumed one showing a strength of the brickwork equals 20 per cent. of the strength of the bricks. This line tolerably agrees with the experiments and thus the following proportion may be made:

The strength of the brickwork is nearly proportional to that of the bricks.

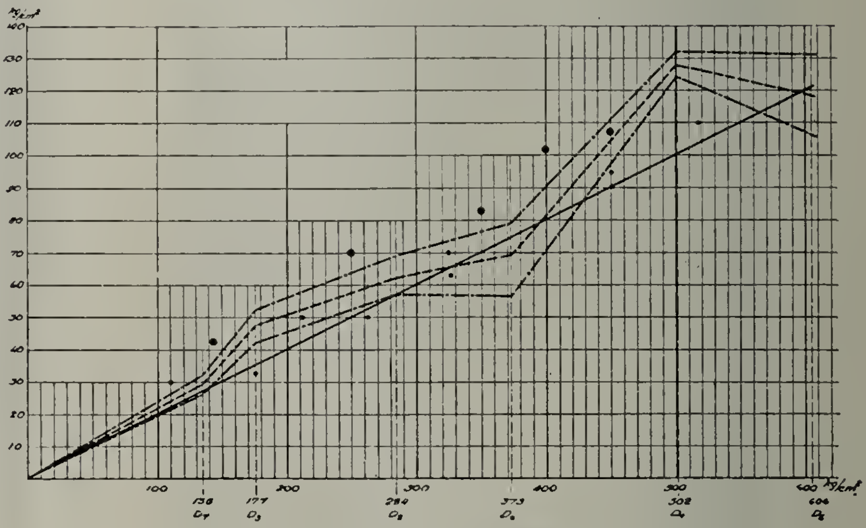


Fig. 1.

Compressive Strength of Brickwork.
Small Dot Indicates Single Test With Standard Brick.
Large Dot Indicates Single Test With Large Brick.
Figures to Left Represent Compressive Strength of Brickwork.

The round dots in the diagram show some single experiments being referred to normal pillars.

The result of the experiments generally show good and

Mark	Kind of brick	Compressive strength in kg/cm² in 10 brick	Average
D_2	Liver colored of fairly equal size, but the single bricks not being smooth	157, 200, 200, 208, 234, 243, 261, 417, 417, 503.	284
D_3	Scarlet of fairly equal size	130, 139, 157, 157, 157, 174, 191, 208, 208, 261.	177
D_4	Yellow clinker burned, machine-brick of quite different sizes	417, 425, 434, 477, 486, 512, 538, 547, 590, 590.	502
D_5	Red machine brick, clinker burned of fairly different sizes	455, 476, 496, 517, 569, 641, 661, 672, 672, 900;	606
D_6	Red machine brick of equal sizes	189, 227, 258; 332, 378, 408, 427, 455, 474, 577.	373
D_7	Red machine brick, slightly burnt, of fairly equal sizes	113, 121, 121, 123, 130, 139, 139, 142, 147, 174.	135

equal progresses, though, owing to unequalities of the bricks, some irregularities appear in the experiments. The experiments as to the compressive strength of the bricks show as follows:

Hereby the compressive strength was settled in usual way, the brick being halved, both the halves being put together with cement and finally the surfaces being smoothed and the brick specimen labeled.

All of the brick above mentioned were of normal size, viz.: 250x120x65 mm.

Influence of the Strength of Mortar.

The influence of the strength of mortar is, at normal joints (10-12 mm.) much less than the influence of the strength of brick. At thicker joints, on the contrary, the strength of the mortar will exert much influence on the strength of the brickwork.

The influence of different sorts of mortar at normal thickness of joints is, however, of the greatest importance. For this purpose "normal pillars" were made with brick of equal size, but with different kinds of mortar. The compressive strength of the mortar was tested on cube-formed specimens, with 7 cm. side.

Serie 2.

Normal pillars. Medium compressive strength of brick, 284 kg/qcm. Normal size of brick (k indicates line, c cement and s sand.

Indication	Compressive strength of mortar kg/cm²	Strength of mortar kg/cm²	Mixture of mortar	Compressive strength of brickwork kg/cm²
S s	284	0	$0_k \div$ sand	52
I D_2 a	284	2,7	$1_k : 3_s$	52
I D_2 C_2	284	25,	$2_k : 1_c : 9_s$	102
I D_2 C_3	284	49, o	$1_k : 1_c : 6_s$	130
I D_2 C_4	284	90, o	$1_k : 2_c : 9_s$	120
I D_3 C_1	284	115. o	$2_k : 1_c : 7_s$	136
S c	284	184. o	$1_c : 3_s$	140

Fig. 2 shows graphically the progress. The dotted line is a connection-line of the results of the experiments. Unfortunately, no sufficiently numerous experiments have been made, in order to obtain a sure result throughout. Certainly, until further, you may infer some conclusions from the gained results.

It appears from the experiments that the strength of brickwork km increases at the same time as the strength of the mortar, but not in the same proportion.

When the strength of the mortar k_b increases from 0 to 50 or 60 kg/qcm, k_m will increase rather considerably. On the contrary, when k_b exceeds 60 kg/qcm, the strength of the brickwork (at 10-12 mm. thickness of joints) will not increase worth mentioning, which has been confirmed through experiments with pillars of many sizes. The round dots show some single experiments.

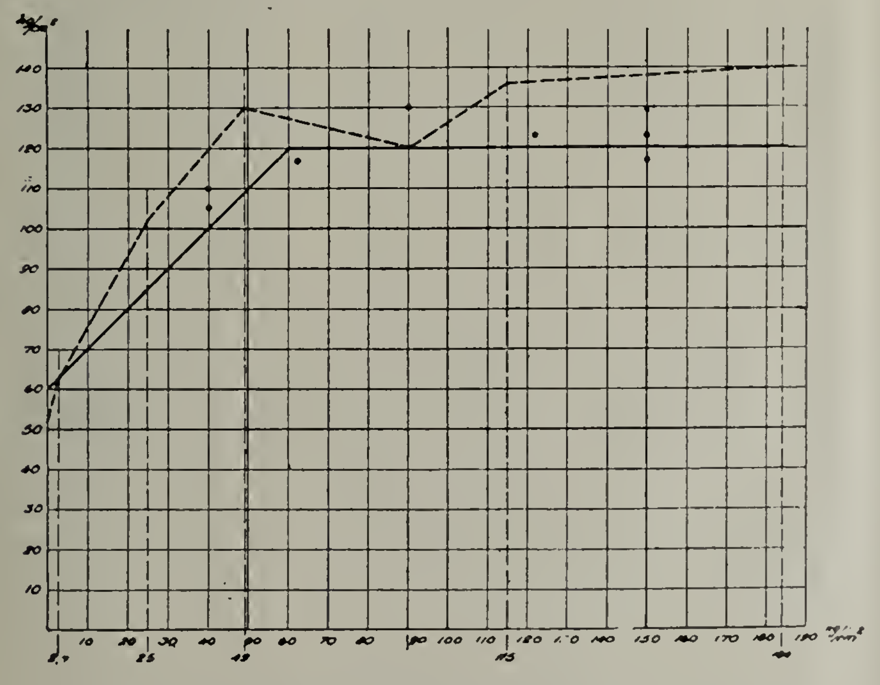


Fig. 2. Strength of Mortar.
Dot Indicates Single Tests Independent of Great Series.
Figures to Left Represent Compressive Strength of Brickwork.

In order to be sure, it was assumed at the calculation, that the progress follows the full line in Fig. 2. This may be stated as follows:

$$k_m = k\left(1+\frac{k_b}{60}\right) \text{ or } k_m = \frac{k}{6}\left(6+\frac{k_b}{10}\right)$$

Here k indicates the strength being obtained in brickwork when $k_b=0$ and k_b indicates the compressive strength of mortar· Especially it is to be remarked that when the strength of mortar is greater than 60 kg/qcm, k^2 is stated only to be =60. From the experiments it appears that, as before said, a compressive strength of mortar, being greater than 60 kg/qcm. does not improve the strength of brickwork by a thickness of the joints of 10-12 mm, being presumed.

This might be explained by the fact that when the brickwork has been strained to said limit, too great tensile stresses arise in the joints of the mortar on account of the tension in the joints of the brickwork perpendicularly to the direction of the compression. On the contrary, when the mortar also possesses a great tensile strength a considerably greater compressive strength of the brickwork will be gained, peculiar as it looks. This made me think of furnishing the horizontal joints with wire-net, thus forming a reinforcement in the mortar, and thereby I have gained especially good results, as will be shown in the following:

Generally, you can say:

The thinner the joints are, the less influence has the strength of the mortar and vice versa.

This especially appears when going to the limit cases. At a thickness of joint = 0, it is undoubtedly present, that it is quite unimportant if the mortar be weak or strong. In opposite case, for instance, if the joints were as thick as a brick, it is also beyond doubt that the strength of the mortar has as great an influence as that of the brick.

The most often occurring thickness of joints, namely, 10-12 mm., is between both the above mentioned limits and it appears from the experiments that, in this case, the compressive strength of mortar increases the strength of the brickwork, only within a certain before stated limit.

Thus, the question about the influence of the strength of mortar also is intimately connected with the strength of joints.

3. **The influence of the proportion between the height and the breadth of the brick-pillars.** The experiments have shown that high pillars have a smaller strength than low pillars of equal brick and equal mortar. Thus, they are subject to the same laws as pillars, for instance, of concrete, iron and wood.

In order to elucidate this question, partly single experiments and partly series of experiments were made.

Serie 3.

Size of the brick: 270x130x95 mm. Mortar, 1 k:3s. Compressive strength of the brick, medium 230 kg/qcm.

	Indication.	Heigth, h in cm.	Breadth, b in cm.	h:b	Strength of brickwork, kg/cm².
1	A_m + a	11	27	0,4	565
2	A_m + a	22	27	0,8	163
3	A_m + a	33	27	1,3	137
4	A_m + a	44	27	1,6	114
5	A_m + a	55	27	2,0	77
6	A_m + a	67	27	2,5	72
7	A_m + a	78	27	2,9	Broken
8	A_m + a	90	27	3,3	55
9	A_m + a	101	27	3,7	62
10	A_m + a	112	27	4,2	62
11	A_m + a	124	27	4,7	53
12	A_m + a	135	27	5,0	55
13	A_m + a	146	27	5,4	45
14	A_m + a	157	27	5,8	43
15	A_m + a	167	27	6,2	46,5
16	A_m + a	177	27	6,6	46,5
17	A_m + a	189	27	7,0	43
18	A_m + a	200	27	7,4	43

This serie is graphically shown in Fig. 3. The broken dotted line is a connecting line of the points of the experiments.

The proportion h:b is drawn as abscisses and the correspondent value of strength of the brickwork is drawn as ordinates. When $\frac{h}{b} < 2$, great difference in the strength will generally be obtained, which, however, is of no practical importance.

The full line indicates a medium line of the experiments.

The curve may be drawn in accordance with the following formula:

$$k_m = \frac{A}{B + \frac{h}{b} C}$$

in which formula A, B and C are constants that must be settled empirically. The results are stated in the following:

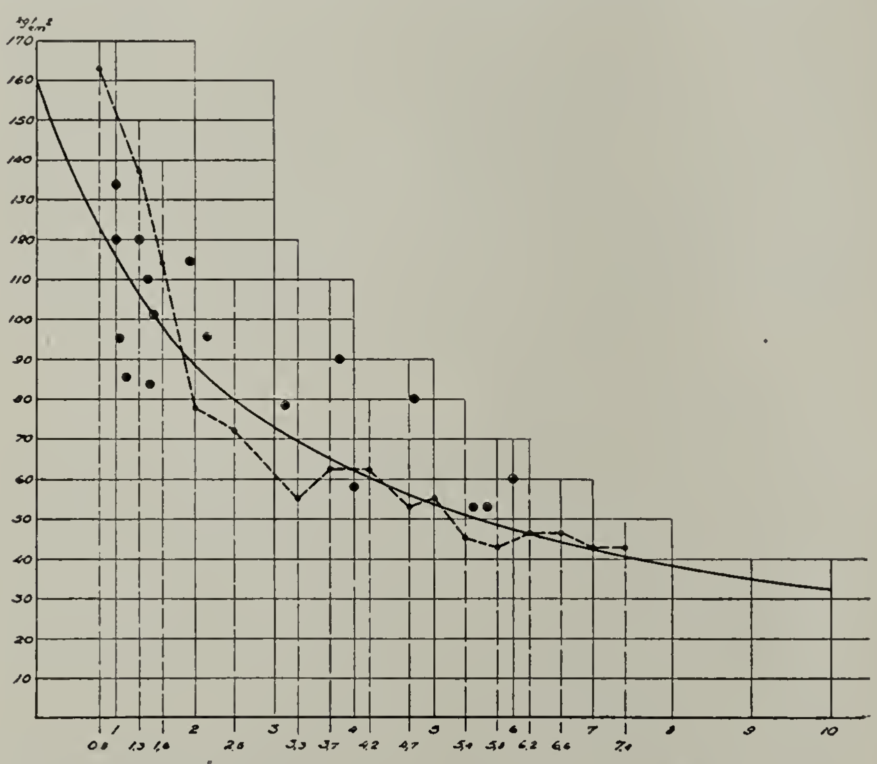


Fig. 3. Relative Relation Between the Heighth and Width of Brick. Dot Indicates Single Test. The Compressive Strength of Brick, of Which Through Direct Proportion Being Reduced to the Same Value as the Tests Along the Dotted Line, Showing a Separate Series of Tests.

Figures to Left Represent Compressive Strength of Brickwork.

4. Combination of the influence of brick and mortar and the influence of different proportions h:b on the strength of brickwork.

On account of the above stated series of experiments an empiric formula for the strength of brickwork could be obtained, viz.: For different strengths of brick and mortar, as also different values for $\frac{h}{b}$.

The following indications are used:

k_m = compressive strength of brickwork in kg/qcm.
k_z = compressive strength of bricks in kg/qcm.
k_b = compressive strength of mortar in kg/qcm.
h = height of a pillar in cm.
b = breadth of a pillar in cm.

For bricks (used by the new Town Hall building in Stockholm) of a size 270x130x95 mm you obtain:

For brick (used by the new Town Hall Building in Stockholm) of a size 270x130x95 mm., you obtain:

$$1)\quad k_m = \frac{k_z\,(6 + \frac{1}{10} \cdot k_b)}{10 + 4 \cdot \frac{h}{b}}$$

By this formula and in the following it is to be remarked, that, when the strength of mortar is greater than 60 kg/qcm. k_b, however, may be settled to 60.

Further, it is assumed that this formula, as well as the following ones (2 and 3), refer only to brickwork with a thickness of the joints of 10-12 mm.

The full curve in Fig. 3 is a graphic statement of these formulas, for the values, viz., $k_z = 230$ kg/qcm, and $k_b = 10$ kg/qcm.

The thinner the brick are, the worse the brickwork will be, so that for brick 300x140x75 mm. and for normal brick, sized 250x120x65mm., other values on the constants are obtained, as follows:

$$2)\quad k_m = \frac{k_z\,(6 + \frac{1}{10} k_b)}{11 + 4,5 \frac{h}{b}} \text{ for bricks} = 300 \times 140 \times 75.$$

$$3)\quad k_m = \frac{k_z\,(6 + \frac{1}{10} k_b)}{12 + 5 \frac{h}{b}} \text{ for normal sized bricks} = 250 \times 120 \times 65.$$

Example 1. Estimate.

The strength of rupture is for a pillar with brick of a size of .270x130x95 mm. with a height of 1.5 m., viz:

$$\frac{h}{b} = \frac{150}{27} = 5,5.$$

Strength of bricks = 220 kg/cm². and strength of mortar = 6 kg/cm².

$$k_m = \frac{220\,(6 + \frac{1}{10} \cdot 6)}{1 + 4 \cdot 5,5.} \cong 45,5 \text{ k8/cm}^2.$$

The experiment made showed a result of 53 kg/cm².

Example 2. Estimate.

The strength of the rupture for a pillar with bricks of normal size and with its $\frac{h}{b} = 2,5$; $k_z = 260$ kg/cm². and k_b a) = 2,8 kg/cm², b) 36 kg/cm².

$$a)\quad k_m = \frac{260\,(6 + \frac{1}{10} \cdot 2,8)}{12 + 5 \cdot 2,5} \cong 67 \text{ kg/cm}^2.$$

An experiment shows a result of k_m = 62 kg/cm².

$$b)\quad k_m = \frac{260\,(6 + \frac{1}{10} \cdot 36)}{12 + 5 \cdot 2,5} \cong 102 \text{ kg/cm}^2.$$

The experiment made shows a result of 95 kg/cm².

In brickwork, where bricklaying, weather, temperature, and so on, have so great an influence, you cannot expect that the calculated figures fully correspond with the real ones. If, therefore, the divergences between formulas and reality are not greater than the divergences between the results of strength of two equal specimens, made under the same conditions, the result must be considered to be satisfactory.

I have found that the results of the formulas will not often show a greater divergence from the experiments than 10 per cent. and very seldom 25 per cent.

In the following, the real results of the experiments are compared with the results from the formulas.

Indication	k_z	k_b	h:b	k_m According to the Experiment	Calculated k_m
L D_7 a	135	3,o	3,45	26 – 32	29
I D_3 a	177	3,o	3,5	42 – 52	38
I D_2 a	284	3,o	3,5	57 – 69	61
I D_6 a	373	3,o	3,48	56 – 79	82
I D_4 a	502	3,o	3,3	124 – 132	111
I D_5 a	606	3,o	3,5	106 – 131	129
S s	284	0,o	3,5	52	58
I D_2 C_2	284	25,o	3,5	102	82
I D_2 C_3	284	49,o	3,5	130	105
I D_3 C_1	284	115,o	3,5	136	115

In accordance with the values in Serie 3 appears from the curve as shown in Fig. 3 above.

In order to settle the necessary strength of the bricks of a delivery consisting of large bricks, 300×740×75 (the ordinary size of bricks in middle and northern Sweden), we will fix a fourfold security by an ordinary brick wall with lime-mortar (k_b=8 kg/cm²) and of a thickness of 1½ bricks and a height of one story of 3,3 meters, in case the allowed stress of the brickwork is 7 kg/cm². This supposition also generally agrees with the reality.

$$\text{Then } \frac{h}{b} = \frac{330}{46} = 7,2.$$

and $k_m = 4 \cdot 7 = 28$ kg/qcm = the necessary strength of rupture of the brickwork by fourfold security.

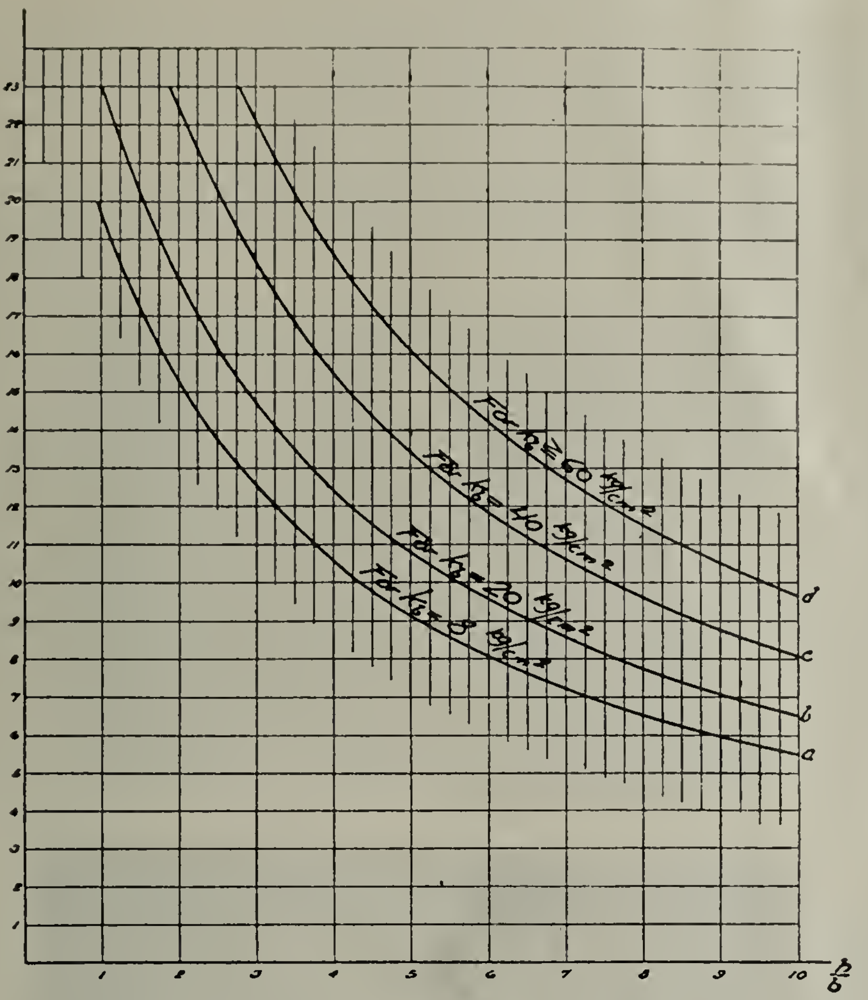


Fig. 4. Curves of Stress Allowed on Brickwork.

If the above stated value be inverted in the formula for large brick, you will get

$$28 = \frac{k_z\,(6 + \frac{1}{10} \,.\, 8)}{11 + 4 \times 5 \times 7{,}2}$$

$$k_z \simeq 179 \text{ kg/qcm or round 180 kg/qcm.}$$

For normal bricks 250x120x65 mm (the ordinary size of bricks in south and western Sweden) you should, under the same supposition concerning $\frac{h}{b}$ obtain

$$28 = \frac{k_z\,(6 + \frac{1}{10} \times 8)}{12 + 5 \times 7{,}2}\,;\; k_z = 198.$$

or round 200 kg/qcm. This is, concerning the value $\frac{h}{b}$ not quite right, it being here the question of another size of the bricks; the fault is however too small to be considered.

I think I have shown by these examples that the necessary strength of brick for getting good brickwork ought to be:

180 kg/qcm for great brick 300x150x75, and

200 kg/qcm for normal brick 250x120x65.

With such brick the walls of an ordinary building can obtain necessary strength, without being too thick.

Fig. 4 shows the curves for the greatest allowed stress of brickwork made of great brick, with a strength of 180 kg/qcm, or also of normal brick, with a strength of 200 kg/qcm, at a mortar strength of respectively 8, 20, 40 and 60 kg/qcm.

(To be continued.)

NOW IS THE TIME TO ADVERTISE.

Anxiety was felt on our entrance into the war as to its affect on business and advertising. Fear of the halt in prosperity resulted in a hesitancy throughout the country, a feeling which has been of short duration. It is interesting to note how the fears of men worked the same everywhere. In England, as Mr. P. G. A. Smith points out in Printers' Ink, the fear and nervousness of the public brought business almost to a standstill in the first few weeks of the war. The more courageous firms went right on advertising as if there were no war, while some canceled contracts. Then public-spirited men started the cry, "Business as usual." In a short time, the country responded so splendidly that "business unusual" became the one fitting motto. English newspapers are now printing all the advertising they can carry, all lines of business "boom," the people have more money to spend than ever before, firms that had faith in the future are enjoying record prosperity.

The experience of Canada is even more valuable for the United States, because of similarity of conditions. Canadian business, according to F. L. Blanchard, in Printers' Ink, was dazed by the suddenness of the war's outbreak, but in a splendid reaction the manufacturing industries in 1916 showed an increase of 43 per cent. over the preceding year. Timid advertisers, who cut down their advertising at the start, have since realized the truth of the warning then given, that for every dollar cut off from their advertising appropriations, they would have to spend three to regain their former position. A period of greater prosperity than ever lies before the United States. We shall need to economize in foods, not because of scarcity for ourselves, but in order to increase the surplus for Europe. If the experience of England and Canada counts for anything, every line of trade will be good. There will be work for all, a bigger volume of business than ever before, and the American habit of spending freely will keep more money in circulation than before the war started.—Exchange.

EVANSVILLE POTTERIES BUSY.

THE plants of the Crown Pottery, the National Pottery and the Helfrich Pottery in Evansville are being operated on full time, and, in fact, all have since the first of the year. The Crown company employs 400 workmen, the National 150 and the Helfrich 250. Aaron M. Weil, who is president of both the Crown and National, says that the Evansville companies have been experiencing quite a lot of difficulty in getting raw materials. "While none of the Evansville plants have been forced to close down on account of not getting raw materials," said Mr. Weil, "they have at times come pretty close to it. Manufacturers all over the country are having the same trouble. We are operating right along and business is good. We look for little improvement in transportation facilities, if any, until after the European war has come to a close. Many of the big railroad companies of the country have taken off many of their trains and this is going to have a bad effect, too, on manufacturers in getting their raw materials. As the war progresses and troops and munitions are being moved by the government, manufacturers are going to feel more and more the lack of transportation facilities, and it is going to be harder to get raw materials. While the manufacturers of pottery in Evansville have been doing a fine business all this year, they are up against many things because of the war, but the problem of getting raw materials is one of the greatest problems that is just now worrying them." The workmen in the three Evansville plants have been given advances in wages since the first of the year and the employes are well pleased with working conditions, Mr. Weil says. The Evansville plants are among the largest in the Central West. After the war it is expected business will boom in the pottery line as in many other lines. Mr. Weil is optimistic over the future outlook, and says that if the railroad situation would only improve, everything in the Evansville field would be lovely. Mr. Weil is one of the real live progressive manufacturers of Evansville. The three potteries in that city pay the highest wages of any industries in Evansville, and Mr. Weil says it is a pleasure to be at the head of institutions that have this reputation.

The cost of coal is reminding the people of the importance of warm housing. This not only applies to the building of homes, but it should serve as a reminder that warm housing is good for livestock as well as for people, and it should go without saying that a brick wall is a better protection against cold than a thin lumber wall full of cracks, whether it be for hog pen or barn.

MID-SUMMER MEETING OF AMERICAN CERAMIC SOCIETY

TRIPS OF INSPECTION THROUGH A LARGE NUMBER OF CERAMIC INSTITUTIONS LOCATED IN WESTERN NEW YORK AFFORD MUCH PLEASURE AND PROFIT TO AN ENTHUSIASTIC DELEGATION

THE COMMITTEE ON ARRANGEMENTS for the summer meeting of the American Ceramic Society prepared a splendid program, which was thoroughly appreciated by the forty-odd delegates who made the trips on July 17 to July 20, inclusive, covering such points as Hornell, Alfred, Corning, Canandaigua, Rochester and Charlotte, N. Y. There was not a wasted moment in the four days of pleasure seeking and plant inspection, thanks in a large measure to Ross C. Purdy, chairman of the committee on arrangements, who was a splendid leader and looked carefully after the interests of the society and each individual present as well.

Twenty-nine ceramists met at Hornell, N. Y., Tuesday morning, July 17, and journeyed by motor bus over a delightfully scenic paved highway that led almost to the very doors of New York State School of Ceramics, located at Alfred, N. Y. This excellent school, which has done so much for the clay industries of New York and other Eastern States, made a deep impression on the visitors. Its ideal location, nestling so picturesquely among the beautiful foothills of the Allegheny mountains, gave at the outset a feeling of quiet contentment and absolute satisfaction.

At the New York School for Clayworkers.

We were royally greeted by Prof. Chas. Binns, head of the ceramic department, who was ably assisted in the entertainment features by his staff and the art students of the summer school.

The visitors inspected the class and lecture rooms, the laboratories, and, in fact, every nook and corner about the neat, orderly place. Much interest was taken in the work being carried on in the molding, casting and decorating departments, by the summer students, consisting of fifteen young women, who were learning to make art pottery. The lecture, class rooms and offices of the ceramic school were decorated with handsome bouquets of roses. Of chief interest was Prof. Binns' private collection of pottery made by himself, it being his ideal in stoneware. It was most attractive and artistic in its variety of styles, shapes and glazes. So valuable do the art critics consider Prof. Binns' work that many of his products have been purchased for the permanent exhibit in Chicago.

An enjoyable luncheon was served in one of the large lecture rooms, the art students serving delicious sandwiches and cakes in wicker baskets and supplying numerous cups of splendid coffee. After lunch President B. C. Davis, of Alfred University, made a short address, which interested the visitors.

The ceramists reluctantly left Alfred at 3 o'clock and journeyed to Hornell by motor bus, where they caught the Erie for Corning, N. Y. After a supper at the Hotel Dickinson we were escorted by Mr. Morris Gregory, of the Corning Terra Cotta, Brick and Tile Company, up to his fine brick-built home, where we were served some of Lake Keuka's famous wine, and then were taken to the Corning Club, where a Section Q meeting was held. This lasted until nearly midnight, and was a most interesting business meeting. Mr. Purdy acted as chairman and asked for a roll call, each man giving, in turn, his name and business and a few other personal remarks. There were thirty-five at this meeting. Questions for the good of the society were discussed at length, the consensus of opinion being that greater funds should be raised in order that a salaried editor might be secured who would be able to devote all his time to the work and be supplied with funds to publish papers, discussions and other valuable matters in leaflet form previous to the appearance of the transactions of the society proper.

Increasing of the membership seemed to be the opinion of the majority present as the best means of securing the financial support desired. The ways and means of securing a larger membership were thoroughly discussed, it not being deemed advisable by those present to raise the dues of the present membership for this purpose. Many valuable suggestions were made and plans were laid for an active campaign along several lines. Greater publicity of the society's benefits and purposes through the columns of the clay journals was urged.

R. C. Purdy, Chairman Committee on Arrangements.

A telegram of greeting from Mr. C. A. Bloomfield, of Metuchen, N. J., was read and accepted with a vote of thanks. By a unanimous vote the chairman was instructed to send a telegram to Prof. Orton, secretary of the society, who is at present in the training camp at San Antonio, Tex., expressing the good wishes of the members for his success in the present undertaking. Even as the hour approached midnight the ceramists were reluctant to retire to their rooms and prepare for a busy day on the morrow.

Art Glass and Its Manufacture.

Early Wednesday morning we were escorted to the plant of the Steuben Glass Works, where we visited one of the most interesting factories inspected on the trip. It is almost a one-man plant, the entire success being due to the efforts and knowledge of Mr. Frederick Carder, a most pleasant and interesting gentleman, who is a self-made man in the best sense of the word. As a boy he worked about the pottery of his father and gained a decided dislike to the work of potting, although absorbing much valuable information of that branch of the ceramic field. He had a liking for things mechanical, and his ability along this line was of great assistance to him when he entered upon his studies in the glass industry. His ambition was to be an artist. While working in a glass factory in England he took a course in art in a night school, and never allowed an opportunity to pass unavailed for study and investigation in things artistic. He carried on a great many experiments, living in the time when glassmaking was in its crudest form, having little or no standard leaders to follow, and worked out for himself ideas and means for carrying on to a most successful end his work in the glass industry. A modest detail of his life's work was given by him during the Section Q meeting the evening previous, and the rich reward for his efforts could be seen in the high-grade, magnificent ware he was making in his present large factory. The shapes, colors and textures of his decorative glassware can hardly be equaled in this country. The trip through this plant alone was well worth the trip to every ceramist present. We were cordially greeted at the office and escorted to the exhibit room, where we had our eyes opened to things artistic in the decorative glass line. Unfortunately the making department was not in operation, due to the necessity of kiln repairs; however, the ceramists were much interested in the plan of same. The decorating, grinding and stock rooms were visited and held much interest for the delegates.

Views of the Glaze and Modeling Rooms and Building Housing the Ceramic Department of the New York State School of Ceramics, Alfred, N. Y.

From the Steuben Glass Works about thirty-six ceramists went to the Corning Glass Works, where we were received by Dr. Eugene G. Sullivan and a committee selected for the purpose. This plant manufactures a large line of glassware, including electric light bulbs, baking ware, battery jars, cane, chemical glassware, chimneys, cylinders, headlight glasses, lantern globes, lenses, light filters, optical glasses, tubing, X-ray shields and the celebrated pyrex ware, used in cooking. The company has made a specialty of the production of technical glassware for over fifty years, and hence maintains one of the most fully equipped laboratories in the world devoted to the study of many technical problems in the manufacture of glass. The results of their research work have revolutionized the industry during the last score of years. The high plane on which this plant has been established is shown in every department of their factory. The company employs over 2,000 workmen. Of much interest was the blowing of the glass. Hundreds of men were at their appointed places, blowing and shaping in iron molds glass shapes as fast as they could be supplied with the blow-pipe with bit of molten glass attached.

The machines, which did the complete operation automatically, being almost human in their work, brought thoughts of the coming of a machine age in the glass industry. The pulling of the glass tubing, the trimming, sizing, etc., were all departments holding much interest. The manufacture of glassware for cooking purposes would not have been thought profitable several years ago, but to-day, with the added knowledge in making superior, high fire-resisting glass, this company is leading the way in this particular.

With Gregory at Corning.

After a hearty lunch we walked to the plant of the Corning Terra Cotta Brick and Tile Company. Messrs. Morris Gregory and Alfred Maltby acted as guides. The plant has been written up several times by The Clay-Worker and needs no introduction to our readers. It is a splendid plant, manufacturing a high grade of architectural terra cotta, building, and acid-resisting brick and paving brick. Just recently they have become a new licensee of the Dunn Wire-cut Lug Brick Company and were running on same while the ceramists were there. They also manufacture repressed pavers. Their acid-resisting brick are repressed vitrified brick, being much smaller than the ordinary brick, due to the repressing and higher firing. Every nook and corner of the terra cotta department was thoroughly inspected, as was the brick and tile-making branches of the plant. Much time was spent in studying the kilns, modeling rooms, slip department and the experimental laboratory.

The party next visited the plant of the Hawkes Company, where they were initiated in the mysteries of glass-cutting, a very interesting process.

At 7 o'clock that evening a dinner was tendered the ceramists by Messrs. M. E. Gregory, Frederick Carder and Dr. Eugene Sullivan, at the Corning Club. Covers for thirty-six were spread, the table being decorated with beautiful rambler roses from Mr. Gregory's own yard. An excellent dinner was served, after which a roll call, with humorous and serious thoughts interwoven, was enjoyed, rounding out a day of much pleasure and profit.

Early Thursday morning we boarded a train for Watkins Glen and spent a most delightful morning walking down this intensely interesting natural wonder, with its chasms, cascades, gorges, falls and unique rock formations. At 11 o'clock the party left for Canandaigua in sufficient time for a shore dinner at the famous Flanigan's restaurant.

The afternoon was devoted to a trip through the plant of the Liske Manufacturing Company, manufacturers of enameled ware, including aluminum ware, anti-rust tinware, automobile filler, galvanized cans, etc., cooking utensils, baths, tubs, sprinkling cans, sprays, boilers, kettles, bed pans, buckets, pots, percolators, copperware, lanterns, photography development trays, poultry supplies, refrigerator pans, roofing caps, separators, soap dishes, bath fixtures, spoons, steamers, toilet jars, washbasins, etc.

Mr. Clarence C. Keehn acted as escort. Every department was visited, from the cutting of the raw material, molding, shaping, trimming, riveting, soldering, enameling, spraying, baking, and even to the packing of the ware for shipment. We could have spent many more hours than we did in watching the various branches of the work.

The ceramists were entertained with an auto trip about the beautiful city of Canandaigua, and were bidden good-bye at the interurban station, where they boarded a special car for Rochester.

Friday morning we visited the plants of the Pfaudler Manufacturing Company, manufacturers of glass enameled steel products, and the Taylor Instrument Company, manufacturers of temperature measuring apparatuses. Both plants held considerable interest, as did the plant of the Pennsylvania Feldspar Company, visited in the afternoon at Charlotte, N. Y., reached by trolley.

Following the visit to the feldspar grinding mill, the party broke up, some going directly home, some taking the boat for Toronto or the Thousand Islands, or some favorite summer resort in New York State, all voicing the opinion that the meeting was the best ever.

THOSE IN ATTENDANCE.

R. GUY COWAN, Cowan Pottery, Cleveland, O.
T. A. KLINEFELTER, West. Elec. & Mfg. Co., E. Pittsburgh, Pa.
H. A. WEGENER, Western Elec. & Mfg. Co., E. Pittsburgh, Pa.
P. H. H. SWALM, Trenton, T. C. & P. Co., Trenton, N. J.
JOHN B. DAVIS, S. S. White Co., Philadelphia, Pa.
A. V. BLEININGER, Bureau of Standards, Pittsburgh, Pa.
ROBERT T. BOWMAN, Trenton, N. J.
F. A. MORGAN, Chicago, Ill.
A. E. KORMAN, Sheboygan, Wis.
GEORGE HAAF, Pars & Seymour, Inc., Salvay, N. Y.
H. M. BREWSTER, R. Brewster & Son, Chicago, Ill.
C. C. KEEHN, Lisk Mfg. Co., Canandaigua, N. Y.
C. W. BERRY, Laclede-Christy, St. Louis, Mo.
F. G. LORD, Penn. Pulverizing Co., Lewistown, Pa.
ROSS C. PURDY, Norton Co., Worcester, Mass.
M. H. BEECHER, Norton Co., Worcester, Mass.
A. E. GIBBS, P. S. U. Co., Philadelphia, Pa.
A. S. WALDEN, Nat'l Carbon Co., Inc., Cleveland, O.
T. KURABASHI, Mitsui & Co., Eng. Dept., 25 Madison Av., N. Y. C.
JOHN W. HASBURG, Chicago, Ill.
J. L. CRAWFORD, Westinghouse Lamp Co., Bloomfield, N. J.
A. E. WM. RIESS, Sheboygan, Wis.
W. F. LEWIS, The Lisk Mfg. Co., Canandaigua, N. Y.
E. ZORN, Chicago, Ill.
O. C. McCORMICK, Clay Workers Equip. Co., Akron, O.
B. A. RICE, Elyria Enameled Products Co., Elyria, O.
J. E. RANDALL, The Clay-Worker, Indianapolis, Ind.
K. IDE, Asabi Glass Co., Tokyo, Japan.
R. D. LANDRUM, Harshaw Fuller & Goodwin Co., Cleveland, O.
HENRY SCHMIDT, Roessler & Hasslacher Chem. Co., N. Y. City.
W. F. ZIMMERH, Pfaudler Co., Rochester, N. Y.
A. L. DUVAL, Hazel Atlas Glass Co., Washington, Pa.
E. WARD TILLOTSON, Mellon Institute, Pittsburgh, Pa.
M. E. GREGORY, Corning, N. Y.
ALFRED MALTBY, Corning, N. Y.
GEIJI KONDO, Tokyo, Japan.
LEON BASSETT, Worcester, Mass.
CHAS. F. BINNS, Alfred, N. Y.
PROF. J. B. SHAW, Alfred, N. Y.
B. C. DAVIS, President Alfred University, Alfred, N. Y.
CHAS. H. KERR, Southbridge, Mass.
ALONZO TITSWORTH, Alfred, N. Y.
HERBERT W. MOORE, Perth Amboy, N. J.
CARL GREGORIUS, Corning, N. Y.
R. T. STULL, Dunn Wire-Cut Lug Brick Co., Conneaut, O.
A. S. WATTS, Ohio State University, Columbus, O.
C. B. THWING, Thwing Inst. Co., Philadelphia.
EUGENE F. SULLIVAN, Corning, N. Y.
MR. LEWIS, Locke Insulator Co., Victor, N. Y.
GEO. BROWN, New Brunswick, N. J.
G. V. BAKER, Charlotte, N. Y.
RAY TAYLOR, Rochester, N. Y.

INTERNATIONAL'S WELFARE WORK.

REALIZING THE NEED of more practical co-operation between capital and labor in these times of high material and labor cost, the International Clay Machinery Co., through their new general manager, Mortimer Silverman, ecently placed a bonus system in their foundry.

The system is based on a greater production per man per day, which production cost cuts down the cost of manufacture of International's castings.

The system has appealed most readily to the workmen, as the company splits with the workmen the entire saving each month in the cost of production.

It is said that a foundryman drawing $125 per month wages, who increases his production 100 pounds per day, can make an extra $55 per month bonus through this system, the company, of course, profiting the same amount on the same man in the same period of time.

A few of the rules of the system are:

First, a man to share in the bonus of any month, must have been in the service of the company the month previous to the month under consideration.

Second, a man to share in the bonus, must also be in the service up to and including the fifteenth of the month, following the month for which the bonus is figured.

Loss of bonus takes place under the following rules:

First, more than one day's absence during the month without permission of foundry superintendent, or certificate of doctor as to disability, or other proven reasonable excuse.

Second, infraction of rules with reference to using or bringing liquor on the premises.

Third man leaving the service after the fifteenth, and not calling for the bonus between the fifteenth and thirtieth, will forfeit bonus, the same to be pro-rated to the balance of the men on the next bonus payment.

Fourth, no bonus will be mailed or given to anyone other than the individual earning same, except authorized member of family.

This is not the first welfare work that International has been interested in, as some time ago they employed legal aid for all workmen, which gives International workmen legal advice free of charge.

International will take pleasure in giving the details of their various welfare systems to any employers of laborers in the clayworking industry.

BRICK AND TILE MEET EVERY REQUIREMENT.

A leading Indianapolis architect said recently: "I am advising my clients to build of brick and tile, as those materials are adequate for all building purposes, and there is an abundant supply of both. For large operations steel is not only very expensive, but well-nigh unobtainable."

The same idea finds expression in a message sent from Chicago July 21 by the Illinois Society of Architects to the National Council of Defense at Washington, as follows:

"We suggest that the Council of National Defense advise the architects and builders of the country to refrain from constructing steel and reinforced concrete buildings and to revert to the old standard of building construction; that is, brick and mill constructed buildings wherever practicable, in order that the steel of the country may be conserved for governmental needs. We believe it to be the patriotic duty of architects and builders to use a minimum of steel in these trying times."

The foregoing, together with the pertinent suggestions on page 36 of this issue, is of special importance at this time. We trust that our readers will not neglect the opportunity to boost brick and tile effectively for all structural work now in prospect. We suggest that each one get in communication with his senators and congressmen, and also with the members of the Council of National Defense, calling the attention of each to the availability and superiority of brick and tile for all building purposes. DO YOUR BIT of timely boosting now.

W. H. BRECHT PRESIDES OVER FLAG RAISING CEREMONIES.

A large crowd attended the flag raising ceremonies at the Boone Brick, Tile and Paving Company's plant at Boone, Ia. The flag, a large one of bunting, was purchased by the employes of the plant, while the pole was the gift of the company. The pole has been placed upon the highest building of the plant and is visible for many miles around. A crowd of about five hundred persons was gathered at the brick plant, where a program of music and speaking was heard.

Mayor D. G. Baker was the first to appear, and, after a short talk, Judge J. L. Stevens followed with an excellent talk. W. H. Brecht, secretary of the company, presided over the evening's program, which was a splendid success.

A MOST WELCOME VISITOR.

We were very much surprised and pleased to hear the cheery voice of Dr. A. L. Converse in The Clay-Worker sanctum recently, and we know that his many friends in the clay trade will be glad to learn that he is hale and hearty. He recently celebrated his seventy-fifth birthday. Physically, time has touched him lightly; mentally, not at all. The doctor himself may give this remark a double meaning, but he knows that we intend to infer that he is the same bright, cheery youth who in years gone by was the life and joy of the Illinois Clayworkers' Association. He has been out of the clay business for several years, but the industry and his host of friends in the trade will always have a warm spot in his affections. He assured us of this as, with a warm hand-clasp, we said good-bye at the main entrance to the Indiana Hospital for the Insane.

LOS ANGELES WILL PERMIT USE OF CONCRETE SEWER PIPE.

Outcome of Protracted Struggle Between Vitrified Clay and Cement Interests.

The council of the city of Los Angeles, Cal., has just adopted specifications for the construction of sanitary sewers within the city which permit the use of concrete sewer pipe. The specifications require the pipe to be mechanically tamped and fed, the aggregates to be carefully selected and graded, and proportioned one part of cement to three of aggregates. The tests require 15 pounds hydrostatic pressure, held for 5 minutes without percolation, a 30-pound fracture test and a 5 per cent. absorption test. These tests are similar to, but more severe than those recommended this year by Committee C-4 of the American Society for Testing Materials. There are no provisions in the specifications for hydrostatic or absorption tests for the vitrified pipe.

The adoption of these specifications is the outcome of a protracted controversy between the vitrified clay products interests in the city and the manufacturers of cement pipe. The Board of Public Works adopted these specifications over a year ago and they were transmitted to the city engineer for his approval. The Board of Public Works held public hearings, at which testimony was received as to the quality and durability of cement pipe for use in sewers. The matter dragged on with no definite action, until finally it was brought to a climax by appeal to the council. The city engineer submitted a report strongly condemning the use of cement pipe for sewer purposes. The Efficiency Commission of the city advocated its use, and the Board of Public Works, while nominally approving it, was more or less non-committal. The City Council then reviewed the whole case and finally adopted the specifications.

SUCCEEDS TO POSITION FORMERLY HELD BY CHAS. J. DECKMAN.

H. C. Moatz, treasurer of the Medal Paving Brick Company, Cleveland, Ohio, has been elected to the office of vice president and treasurer, thus assuming, in addition to his old duties, much of the work formerly handled by Charles J. Deckman. Mr. Moatz's long association with the company enables him to take on the additional duties with confidence.

Marvelous!

"This is an eight-day clock, Madam," explained the antique dealer to a purchaser from the country. "It will go eight days without winding."

"Gracious!" exclaimed the customer. "And how long will it go if you wind it?"

It Sounds Ridiculous.

Joseph H. Choate said, at a luncheon in New York:

"When the Germans talk about protecting little nations, freeing the seas and championing international law, it sounds so ridiculous that it reminds me of the tramp.

"'Lady,' said a tramp to a farmer's wife, 'could you oblige me with the loan of a cake of soap?'

"'Soap?' she said. 'Do you mean to tell me you desire soap?'

"'Yas'm,' said the tramp. 'Me partner's got the hiccoughs and I want to scare him.'"—Washington Star.

THE CLAY-WORKER

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A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

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One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

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☞Subscribers when ordering a change of address should give both the old and new address.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

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My Country, Right or Wrong—My Country!

CURRENT COMMENT.

Business as usual.

* * *

Eats are more plentiful.

* * *

Those little garden patches are a big help.

* * *

The building business needs a bit of boosting along.

* * *

Take your vacation, then take hold and help make things hum.

* * *

One of the questions of the day is, what constitutes a non-essential? We feel pretty sure it is not a brick.

* * *

We are being told to load all cars to maximum capacity to increase railway efficiency. That's good advice, but you must first catch your freight car.

* * *

The business men of the country are, as a rule, anxious to play fair with and to co-operate with the government in every way practical. This attitude of fair play and co-operation should also mark the plans and deeds of those in government authority in dealing with business and industry.

* * *

We now recognize the need for our inland waterways, and the present problem is to get the people into the habit of using them for freight transportation.

* * *

Not only is lumber very high in price, but the nails used to put it up with are also adding a share to the cost of flimsy building and making more room to push brick.

* * *

Even with the war conditions, we imported a million dollars' worth of china clay last year. This is a million we might keep at home by further development of our own resources.

* * *

For once in a lifetime the railroads are placed as welcoming waterway transportation, instead of fighting it. Others besides the traditional devil can be saintly when sick or in need of help.

* * *

The export trade in clay products will run above five million dollars for the fiscal year ending with June. Just about double what it was the year before. The big increase was in fire brick and in pottery products.

* * *

We have figures covering a splendid showing in our export trade, even in the face of all transportation difficulties, but where figures are shy is on the point of the amount and value of goods sent to Davy Jones' locker by submarines.

* * *

The Trade Extension Department of the National Lumber Manufacturers' Association is issuing a periodical publication entitled "Better Building." It would be a fitting return for the brick trade to turn out one entitled "Best Building."

* * *

One of the effects of war conditions has been actual recognition of associations by the government, and in this way acknowledgement of the fact that organizations are good things to keep industry moving harmoniously and in concert.

* * *

Study your plant and its lay-out thoroughly with a view to improving your methods wherever practical, so as to reduce the labor required. The scarcity of help makes imperative the inauguration of a system that will beget the greatest efficiency, and the use of all practical labor saving devices.

* * *

Architects and building contractors throughout the country are inaugurating a movement to encourage building, instead of the postponing of building operations because material is higher in price. It is argued that lower prices are not likely at any time within several years and now is a good time to build. In this movement the brick men can offer a material which has advanced less in value comparably than other things, as well as a material which will last forever.

HOG HOUSE PLANS.

We were speaking of hog houses, saying something about competitive material in making portable hog houses, over in Missouri and mentioning incidentally that clay products were the things to build real hog houses out of, and along came King. Matt King, secretary of the Permanent Building Society, Des Moines, Iowa, has favored us with a copy of Hog House Plans, Bulletin No. 1, which shows just how to build hog houses out of hollow tile. His plans are splendid and would prove equally adaptable whether built of hollow tile or brick. We hope to see more of them and also more barn plans and other out-buildings showing clay products as the material of construction. They are things that help boost the game along.

MAKE A BUILDING CAMPAIGN.

We are all ready to make whatever sacrifice is necessary for the benefit of war needs, but somehow we have been impressed lately that too much thought has been turned to the idea of sacrifice and not enough to that of making a hustle, of making business good all around, so that we won't need to make a sacrifice. It were better to make a campaign for building, to put forth unusual energy that we may benefit internally and materially, as well as benefit the world morally and socially.

Already many people in the country are realizing there is too much hysteria of saving and sacrifice and that many lines of industry and business are suffering in consequence. Broadly speaking, it should be one of the busiest business years on record, and years of this kind are great years in which to turn attention toward building, toward the erection of homes that will be a matter of pride and satisfaction in the future, and to general upbuilding, that we may be going forward and not drift backward.

Already in some cities organizations have been formed of architects, building contractors, material men and others to promote the idea that it is a splendid year for building operations, and the fact of our being at war should not put a stop to this work. Some materials are high, it is true, and labor is scarce, but this is a condition which promises to prevail indefinitely. If the war ends there will be a great rebuilding in Europe, which will serve to keep the price of material up for years, according to the prediction of the best authorities. So waiting for the price to come down is poor business, especially since when prices come down they bring depression and poor profits. Business profits, wages and everything else are better than usual this year, and these things offset the higher cost of material, consequently it is just as logical to urge building now as at any time. So let us get busy, each man in his own community and each group together, and make a campaign for fall building, to the end that we may all be busier and better off.

CONCERNING COAL.

The clayworking industry needs no reminding that fuel is an important item in producing burned clay, or that the coal problem has been a serious one lately. The main thing every consumer of coal would like to know more about is when coal will be cheaper and when it will be in plentiful supply.

At this writing the situation has been relieved somewhat, but at that it is considerably muddled. The proposition of a $3 maximum mine price on high grade bituminous coal, which brought forth some protest from the Secretary of War, serves the one purpose of setting the maximum below some of the prices that have been charged during the past six months. That maximum, however, is practically double the selling price of much of this coal a year ago. Fixing of an arbitrary maximum has caused no little confusion for the time being, which perhaps will be straightened out in time. The confusion results from an apprehension that while the price may be limited, if not enough coal is coming forward to fill all needs, many who need coal may suffer for want of it and not be able to get prompt shipment or to encourage prompt shipment by paying a premium in the case of dire necessity. If the railroads can move the tonnage and enough miners can be kept at work, the coal situation will clear itself in a short time. Moreover, many new enterprises have been started as a result of inviting prices, so that eventually we may expect an overproduction of coal, with consequent low prices.

Meantime, however, about all that can be said positively concerning the situation is that by this maximum agreement we know what the worst will be in the way of price. Let us hope it will soon be better than this worst indicates.

VACATIONS AS ALWAYS.

The Department of the Interior, in connection with its bulletins about our national parks, makes a splendid suggestion in advocating that business people should take vacations as usual. The position taken is that because our business strength must be kept at par, and the only way to keep it there is to take the needed rest furnished by a vacation.

They advocate the "vacation as always" and "business as usual," and oppose the notion that because we are at war we should forego the vacation. The idea is splendid, but it is desired to amend it here a little and say, push business unusually, and take a vacation and rest, but not necessarily as always. In other words, it is not necessary to make extended trips to secure rests. It is a splendid year to think out plans for a real vacation, which may often be obtained near home with little expense and furnish more actual rest than the popular idea of some extended tour or trip.

Exhausted workers become sluggish, and for this reason the vacation is worth while, because it relieves the sluggishness and furnishes refreshment by change, if not by actual resting. So let us take a vacation, not necessarily as always, but take it and seek a rest, that we may be more fit to push business unusually hard.

ROOFING TENDENCIES.

The tendency of the times in regard to roofing material is indicated by a Geological Survey report on the slate industry. This shows that while the slate industry improved slightly, the value of roofing slate in 1915 was the lowest since 1898, the total of roofing slate for the year 1916 being only $3,408,934, or 9 per cent less than in 1915.

This is significant. Slate is the only roofing material that is in any way comparable to or rivals burned clay, and admittedly clay tile is superior. It is plainly evident that during the past few years the country has been turning largely from shingles to composition roofing and neglecting slate. Meantime, while no statistics are available on the progress of clay roofing tile, it is evident this has been gaining some headway, and it is also evident that it should have practically a clear field in the future where the highest ideal in roofing material is sought. Also it is evident that not slate but composition roofing is the rival to be met and conquered.

There is food for thought in this to those who are interested in or should be interested in the progress of burned clay for roofing material.

NO CHANGE IN MEASUREMENTS.

The American system of weights and measures, while it may not be ideal, is somewhat like the American dollar, in that it is a fairly popular standard at the present time. This thought is put in mind by the action of the National Association of Manufacturers at its recent meeting in going on record as being opposed to agitation for change to the metric system at the present time.

It is pointed out, among other things, that manufacturers have impending burdens of war taxation and it is no time to be adding the cost of changing our standards of weights and measures along with this. Moreover, manufacturers everywhere are so busy that it would be impossible to make the change without seriously hampering work, which is not to be thought of at the present time.

To this they might have added that the American system of weights and measures, with its imperfections, like the American dollar, is better understood and more popular today than ever before, and there is less complication in translating it into the weights and measures of other countries than would be the effort to change it at this time.

THE CEMENT TRADE.

The first half of the year 1917 was one of good business for the portland cement people, according to a report issued by the U. S. Geological Survey. The production in shipments from practically all mills exceeded those for the corresponding period in 1916, and the war in Europe had not apparently curtailed the use of cement during the first six months.

The big demands the first half of the year seems to have come largely from the smaller consumers and mainly in agricultural districts, though, of course, large quantities of cement went into road improvements and larger work.

War conditions have had the effect of increasing the price of cement, for there, as in the clayworking industry, the higher price of coal has added materially to the fuel cost. It is reported that the cost per barrel for burning clinker in the Lehigh district has been greater later than the total cost of manufacturing cement three years ago. This is only part of the increase in cost, for machinery and repairs come higher, too.

If the cement industry keeps up during the last half of the year the same gait as the first half, it may break all high records, but in midsummer there is some indication of a letup in demand, and it is thought that the trade will be curtailed somewhat the latter half of the year in the cement, just as in brick, unless something can be done to stimulate it.

In the case of cement there may be a special demand for military purposes that will make up for the loss in building operations. Anyway, such good progress has been made already that the year as a whole will likely be a good one in the cement industry.

Incident to this report, it may be remarked that the cement industry owes the U. S. Geological Survey a vote of thanks for the promptness in issuing it. Government reports of this kind are more valuable if fresh.

Written for The Clay-Worker.

BUILD WITH BRICK.

A fellow often thinks that he can saunter on through life;
With not a sign of worry, not a trace of care or strife.
Now the story that I mean to tell without a jest or trick;
Is about a man who didn't heed the motto "Build with Brick."
The man who built with lumber had to paint his house, and then,
The heat of summer, warped it so he had to paint again.
Just when he thought that all was well, and all his trouble o'er,
Again misfortune frowned on him, by knocking at his door.
Arrayed this time in Cyclone's garb, to blow his house to bits,
And cost him all the money, he could get within his mits.
He said, one day to Mr. Jones; whose house was built of brick,
"To think I built with lumber, only tends to make me sick.
If I had built with brick at first, instead of ruin today,
I'd have some money laid aside, to keep the wolf away.
Just when a fellow thinks that he can battle life alone,
It only shows his cranium is made of solid bone.
And when he starts a thinkin' he is actin' awful slick,
He will squander 'dough' for lumber when he ought to 'build with Brick.'"

—JAS. L. CARSON.

We actually didn't realize till the army of traffic experts was mobilized and got into action that the biggest thing in the business world was railway rates and traffic arguments.

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WANTED.

Position as superintendent of brick and hollow ware company. Am a good draftsman, can design and erect entire plant. No bad habits. Good references.
Address HOLLOW WARE,
7 2 d Care of Clay-Worker.

WANTED.

At once, 9-ft. dry pan and elevator. State particulars. Cash for immediate shipment. Address HALL,
Care of Clay-Worker.

WANTED.

Assistant superintendent for white ware pottery. State experience in detail and salary expected. Address
POTTER, care Clay-Worker.

WANTED.

To interest a party in a brick manufacturing and building material business. Plant situated right in town; plenty of clay and labor. Address,
ARTHUR C. SHARPLEY,
P. O. Box 529, Birmingham, Ala.

BRICK PLANT WANTED.

City of 25,000 population has no brick plant. Great opportunity for practical brick man. Address
CHAMBER OF COMMERCE,
6 1 dm Florence, Ala.

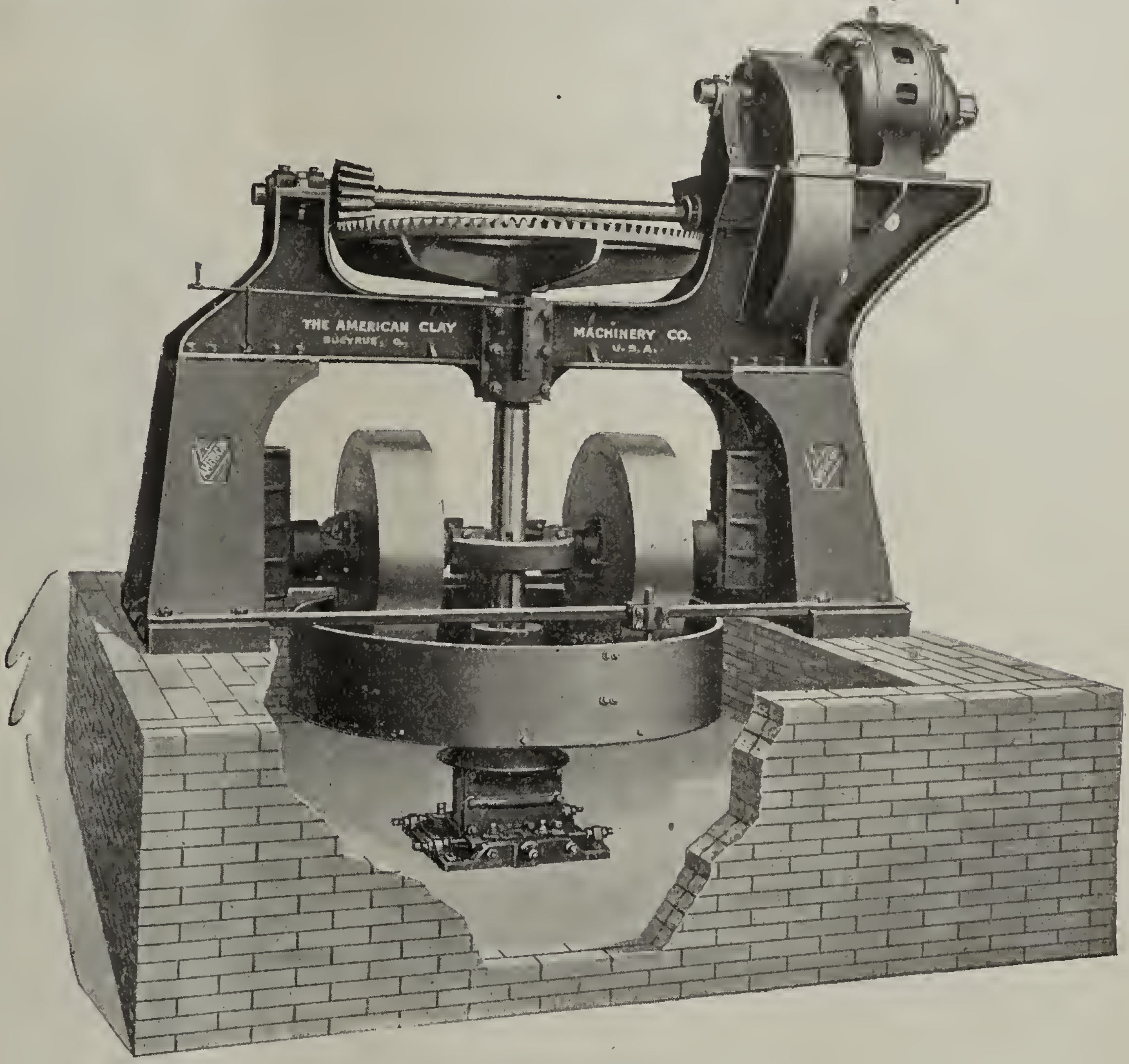
SEE ADS ON PAGES 79, 80.

U.S.A.

Use
Successful
Appliances

American No. 335 Wet Pan

This big, strong, dependable American Pan has been designed to meet every requirement of a heavier pan of larger capacity than our standard machine. That it meets the requirements will be more readily conceded when we state that two of these pans have been in operation twenty-four hours a day for nearly two years and are giving complete satisfaction.


THE AMERICAN CLAY
BUCYRUS, O.
MACHINERY CO.
U.S.A.

Extra Heavy Wet Pan

This Pan weighs over sixty thousand pounds without motor. Only the best of material is used in its construction. It can be furnished for motor or belt drive. Complete specifications will be sent on request.

We build every machine and appliance needed by clay-works. Every machine is "Built Right" and "Runs Right."

The American Clay Machinery Co.

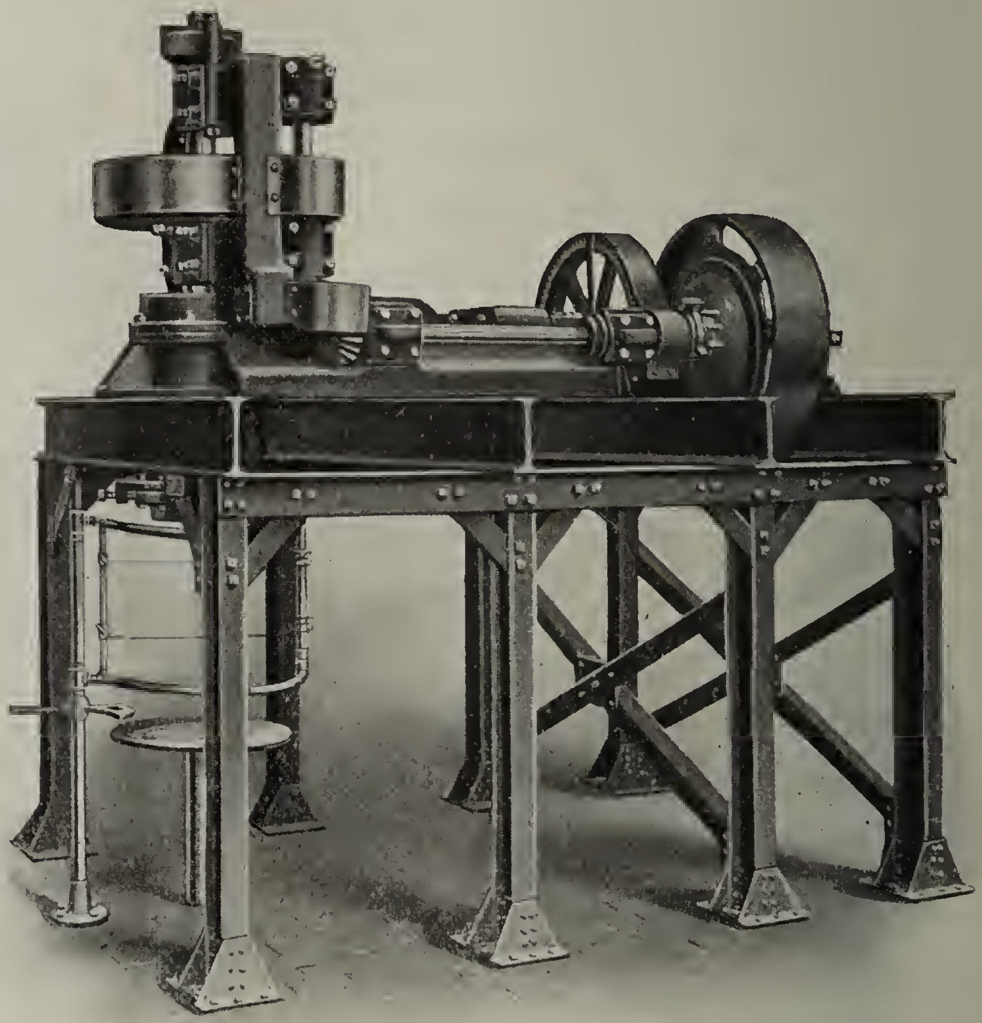
BUCYRUS, OHIO

U.S.A.

**Use
Successful
Appliances**

The American No. 263 Down Delivery Tile Machine

The Down Delivery Tile Machine has many advocates who point to the maintenance of true alignment of tile, which are delivered perpendicularly, as a big point. There is less damage in handling, especially in large tile.
This Machine is carefully designed and substantially built as you will see if you secure a specification sheet which has just been issued. Send for it.



No. 263 Down Delivery Tile Machine

No matter what you need the American Company will gladly furnish it on a quality basis.

Correspondence solicited.

The American Clay Machinery Co.
BUCYRUS, OHIO.

EDITORIAL NOTES AND CLIPPINGS.

F. Briggs Richardson, of Surry, Va., is in the market for some brickmaking machinery.

Spring Garden Brick & Clay Products Co., of York, Pa., has been chartered with $25,000 capital.

Damage to the extent of $25,000 was caused by fire at the plant of the San Antonio Brick Company, San Antonio, Texas.

Newton Morton, a retired brick manufacturer of Boston, Mass., died at his home in that city recently. Mr. Morton had lived in Boston, Mass.

The Dolan Brick Co., of Richmond, N. Y., has been chartered by J. V. Dolan, I. L. Archer and J. P. Fallon, Jr., of 508 West 150th St., New York City.

Armand L. Van Schiever and others are the incorporators of the Gravoe City Tile & Brick Co., Grove City, Ohio. The capital stock of the company is given as $10,000.

The Monroe Silica Co., of Monroe, Mich., has been incorporated with $100,000 capital by J. D. Ford and H. R. Browne. The company will make brick, handle sand, stone, etc.

Application has been made for a charter for the Reading Clay Products Co., of Reading, Pa. W. B. Kunhardt, Jos. S. Pendleton, J. Heber Parker and Fred A. Bigelow are interested.

The Star Fire Clay Co., of Wellsville, Ohio, was recently organized with $25,000 capital stock. John H. and A. B. Smith, James E. and William MacDonald and R. L. Edmonston are interested.

The factory building of the Kittanning Ceramic Company, at Kittanning, Pa., of which H. L. McNees is general manager, are well under way, and will be pushed to completion as rapidly as possible.

Owing to the scarcity in the coal supply, the brick plant at the Kansas state penitentiary, Topeka, has closed down. The brick made at the state plant has been used in the erection of new state buildings.

The Such Clay Company, with $200,000, Perth Amboy, N. J., has been organized to mine clay and sand. F. M. Pearse and George S. Silzer, of Metuchen, and J. E. Stricker, of Perth Amboy, are the chief stockholders.

The Granite Clay Products Company, of North Mountain, W. Va., has been incorporated with $75,000. Those interested are J. M. McClave, of North Mountain, and C. M. Seibert, P. R. Harrison and H. C. Evans, of Martinsburg.

The Smith Brick & Tile Co. has been organized at Mason City, Iowa, by C. J. Devally and George Coppinger, of Sheffield; W. I. Harding, of Sioux City, and C. L. Smith, of Mason City, Iowa. The company is capitalized for $500,000.

The New Castle Mining & Clay Products Co., of New Castle, Pa., has been incorporated with a capital stock of $60,000. The principal stockholders are E. W. Beadle, C. H. Andrews, George T. Weingartner, T. P. Andrews and F. L. Rentz.

Among active clayworkers to give up their positions to join Uncle Sam's fighting forces is Leon Goodman, manager of the Des Moines Clay Company, who will be captain of the new company of engineers being organized in Des Moines as a unit of the Iowa National Guard.

Work has been started on the new three-story building for the Fulton Fire Brick Company, Fulton, Mo., and arrangements have been made to erect four more kilns. All told, the company will spend about $50,000 in improvements. General Manager L. U. Nickell hopes to have all the work completed by the last of the year.

W. B. Sherwood, of Coffeyville, Kansas, is to have the management of the new brick plant to be erected at Baker, Mont.

The Ancho Brick Company, of El Paso, Texas, is making extensive improvements in its plant which it is contemplated will cost over $50,000.

The Thurber Brick Co., Thurber, Texas, was recently awarded a contract to furnish all the paving brick to be used by the city of Dallas for the current fiscal year.

E. E. Morgan, of Carlyle, Iowa, has recently acquired a large interest in the Knoxville Clay Products Co., at Knoxville, Iowa, and will take an active part in the management of the concern.

The Dixie Fireproofing Company of Macon, Ga., has been organized with Russell Bone, president; W. P. Stevens, Jr., vice-president and secretary. They will manufacture silo and fire brick and other clay products.

The second brickyard fire to occur at Belleville, Ill., broke out in the kiln sheds of the Kloess Brick Works early Thursday morning, causing a loss of about $1,500. The former fire was at the plant of the Standard Brick Works, and resulted in almost the entire destruction of the plant.

A new company recently incorporated at Birmingham, Ala., is the M. W. Berry Brick Corporation, of which W. J. Worthington is president and treasurer; W. E. Wilmot, vice-president, and M. W. Berry, secretary and manager. The firm will manufacture brick and other clay products.

A. B. Cook, of Owosso, Mich., has in view of the leasing of the Wolverine Brick Company's plant near Corunna, Mich., and converting it into a drain tile plant. Mr. Cook considers the tile industry one that it will be well to push in Michigan. as that state is not tile drained to any great extent.

After being out on a strike for six weeks, the clay miners of the Lehigh Sewer Pipe & Tile Co., the Plymouth Clay Products Co., the Lehigh Clay Products Co., the National Sewer Pipe & Tile Company, of Lehigh, Iowa, and the Webster City (Iowa) Sewer Pipe & Tile Co., declared the strike off July 9, without gaining any concessions.

The Grand Rapids Brick Company, Grand Rapids, Mich., has its new machinery and electric power installed and now is producing at the rate of about 80,000 brick daily, practically double the old output. The entire output for the season has been sold to the Michigan Face Brick Company and large shipments are being made to Detroit and other points.

The big Lawrence Vitrified Brick and Tile Company plant near the Kaw river, Topeka, Kans., has been sold to J. J. Simonds, of Iola, representing a syndicate of Iola business men, who intend to rebuild the plant and put it into operation after it has been idle for several years. The new company will be known as the Kaw Valley Brick and Tile Company. Some of the machinery in the present plant will be utilized together with new machinery.

The plant of the Glasgow (Va.) Clay Products Co. now has all its machinery installed for a daily capacity of 50,000 bricks. At present the burning capacity is 20,000 bricks, and additional kilns are under construction to increase this to 50,000. The products will be rough texture faced brick, smooth-faced brick, hollowware drain tile, paving brick, common brick. Eventually the company will manufacture refractories, as it has available materials for this class of product.

The Ironton Fire Brick Co., Ironton, Ohio, has been incorporated with $20,000 capital stock, and is establishing a plant for the manufacture of fire brick. The officers are: President, Col. H. A. Marting, of the Marting Iron & Steel Co.; vice-president, Albert C. Steece, president Ironton Portland Cement Co., and secretary, treasurer and general manager, Claude C. Hayward, an expert fire brick manufacturer. Practically all of the equipment has been purchased, and the company expects to have its kilns in operation now soon.

The New Cumberland Brick Co., of New Cumberland, W. Va., has been incorporated with $100,000 capital stock. F. E. Coover is at the head of the enterprise.

The Clay Products Company has been incorporated at Huntington, W. Va., to manufacture a general line of clay products. The capital stock of the company is given as $100,000.

The Raleigh Brick & Tile Company is a new concern recently incorporated with $250,000 capital stock, by B. E. Carter, C. L. Beckner and W. W. Hume. The company will erect a plant at Lester, Raleigh county, N. C.

Richard Loynes, proprietor of the Long Beach Brick Works, Long Beach, Cal., died at his home in that city June 22. Mr. Loynes was 54 years old and had lived in Long Beach twenty-five years. A widow and one son survive.

A. G. Moodhe, a contractor and builder of Spokane, Wash., has purchased the old brick plant at Cheney, and will shortly remove it from its present location and rebuild the same on the tracks of the Northern Pacific railway, where trackage sufficient to supply its needs will be given.

The E. C. Humphrys Co., dealers in fire brick, silica brick, fire clay and molding sand, advise us that on August first, they will move their Detroit, Mich., office to 1201 Book Building, Washington boulevard, and at the same time will open a Cleveland office in the Leader News Building and a Pittsburgh office in the Arrott Building.

A $100,000 plant for the manufacture of tile and hollow ware is to be erected on Bancroft street, near the Toledo-Angola railroad, Toledo, Ohio. A 52-acre site has been purchased for that purpose for $26,500. The plant will be operated in connection with the Auburndale Brick Co. Irving E. Macomber, president of Macomber Bros. Co., will head the new concern. Work on the plans of the factory has been started.

Frank Kasten, of Hammond, Ind., national president of the United Brick and Clay Workers' Union, and Thomas Hutson, president of the Brazil, Ind., Clay Workers' Union, who were sentenced some time ago to serve six and four months respectively in the Marion county jail, Indianapolis, on charges of contempt of the United States Federal Court, were released June 28 by Judge A. B. Anderson at the expiration of Hutson's sentence, with a warning that they should not in the future take part in any of the strike troubles.

Plans have been completed by the Great Falls Brick & Tile Company, Great Falls, Mont., for improvements at its plant on the north side of the Missouri river to cost about $100,000. Designs for a new building, which will be the main feature of the improvement, have been practically completed, and the contract will be let at an early date. S. S. Hobson is the active head of the corporation which owns the plant. The new building will house the machinery for making sewer pipe, drain tile and other hollow ware. The plant is already reasonably well equipped and the addition of the new building and the machinery will make it a modern plant.

Thomas N. Kurtz, the president and general manager of the Standard Refractories Company, of Claysburg, Pa., gave a banquet to the men in control of the active management of the plant. There were thirty-one heads of departments and office men in attendance, together with several invited guests, whose activities have contributed largely to the success of the enterprise. After partaking of a fine banquet Mr. Kurtz presided as toastmaster and gave an entertaining description of the progress of the plant and also some hint of the future plans he has in mind. He took occasion to thank the employes for their interest in the work and loyalty to the company, and promised that the company would soon undertake the promotion of a community building, embracing a reading room, gymnasium and social center where the men in their employ would secure profitable entertainment and recreation.

The Acme Press Brick Company, of Denton, Texas, is erecting an addition for the manufacture of hollow tile.

The Laclede-Christy Clay Products Company announce the appointment of J. H. McKelvey as sales manager, to succeed Mr. H. K. Lackland, resigned.

Wessel, Duval & Co., 25-33 West Broad street, would like to receive prices on five tons best quality rock red molding sand for foundry use, and also 200 pounds of Grade 2 plumbago.

The Carlinville (Ill.) Clay Company has received a large order from the government for large quantities of building and drain tile to be used in construction of one of the aviation fields at Grassland, Ill.

The Jackson Fire Brick Co., Jackson, Tenn., has purchased the plant and business of the Hunt Pressed Brick Co., successors to the Southern Tile & Brick Works, Jackson, Tenn., makers of fire clay brick.

The Columbia Coal and Brick Company has been chartered to manufacture brick and tile; capital, $10,000. Incorporators: Herbert E. Latter, Henry M. Robinson, Wilmington, Del.; Clement M. Egner, Elkton, Md.

The Standard Brick Company, an old established concern of Crawfordsville, Ind., has recently taken out incorporation papers, with $800,000 capital stock. The directors are H. E. Cobb, Edwin M. Brown and Walter L. Brown.

Building operations in Cleveland, Ohio, show a substantial increase in values for May, 1917, over May, 1916. In Akron about 800 houses are now under construction, and it is reported that 10,000 additional houses could be used.

The Tyrone Brick and Tile Company, Tyrone, Pa., whose works are located near Grazierville, recently received an order for 1,500,000 high grade brick from the Susquehanna Silk Mill Company, which operates large mills at Sunbury.

The H. C. Muddox Co., operating a sewer pipe and terra cotta plant at Sacramento, Cal., has filed articles of incorporation, with a capital stock of $250,000. The directors of the company are H. C., J. E., R. H., R. N. and G. L. Muddox.

Walter McGinnis, of El Dorado, and Fred Wark, of Toronto, Kansas, have purchased an immense tract of land near Wichita, Kansas, containing excellent deposits of clay and moulding sand, and will organize a company for the erection of a large plant for the manufacture of brick and pottery.

An Old Excuse.

"You promised if I let you go to the matinee to be home for dinner on time."

"It went extra innings," explained hubby weakly.

INVESTIGATING THE STRENGTH OF HOLLOW TILES.

A series of investigations of the strength of hollow tiles as developed in walls of varying thickness has been started at the United States Bureau of Standards by the construction of a number of these walls 5 feet long by 12 feet high. The walls so far constructed are of three thicknesses—6, 8 and 12 inches. Those already laid up have been set with the tile on end. It is proposed to construct walls of similar size with the tiles placed on their sides. Other variables will enter into the work, and when the investigation is completed about fifty will have been built. Some of these will be tested by direct compression; others by applying a load across the middle of the side with the purpose of determining somewhat the ability of these walls to withstand wind pressure.

Some of the data will be made available for the American Society of Testing Materials, which is now engaged, through one of its committees, in adopting specifications for hollow building tile.

TRADE B MARK

Barrett's PAVING PITCH

The Standard Paving Pitch

NOT every pitch is suitable for paving. Roofing-pitch, for example, would not do at all, although it looks much the same and contractors sometimes attempt to use it on the theory that it is the same thing.

A good paving-pitch will last as long as the pavement—that is to say, twenty or thirty years—and at the end of that time it will be exactly as good as new and fit to use once more in a new pavement if it were worth while to take it off the old blocks.

The Barrett Company has been manufacturing Paving Pitch for something like forty years. We can photograph almost any old pitch-filled pavement and be fairly certain that when we look it up we will find that the pitch in the joints is a Barrett product of a generation ago.

Contractors who use Barrett's Paving Pitch know that it does not bubble and boil over in the kettle. That means that it is free from water and the lighter oils. They find that it holds its heat well and is easily handled by unskilled labor. They find that when hot it is just the right consistency to flow easily into the joints and form a water-proof seal, without, on the other hand, being so liquid that it runs through to the gutters.

In short, they find that Barrett's Paving Pitch is made especially for their use with all their practical difficulties in mind.

The municipal engineer who specifies Barrett's Paving Pitch knows that he can identify the goods by the label on the job. He knows that he is getting a standard product with forty years of experience to back it up; he knows that it is the same material that has made good in lots of other pavements which he knows of elsewhere.

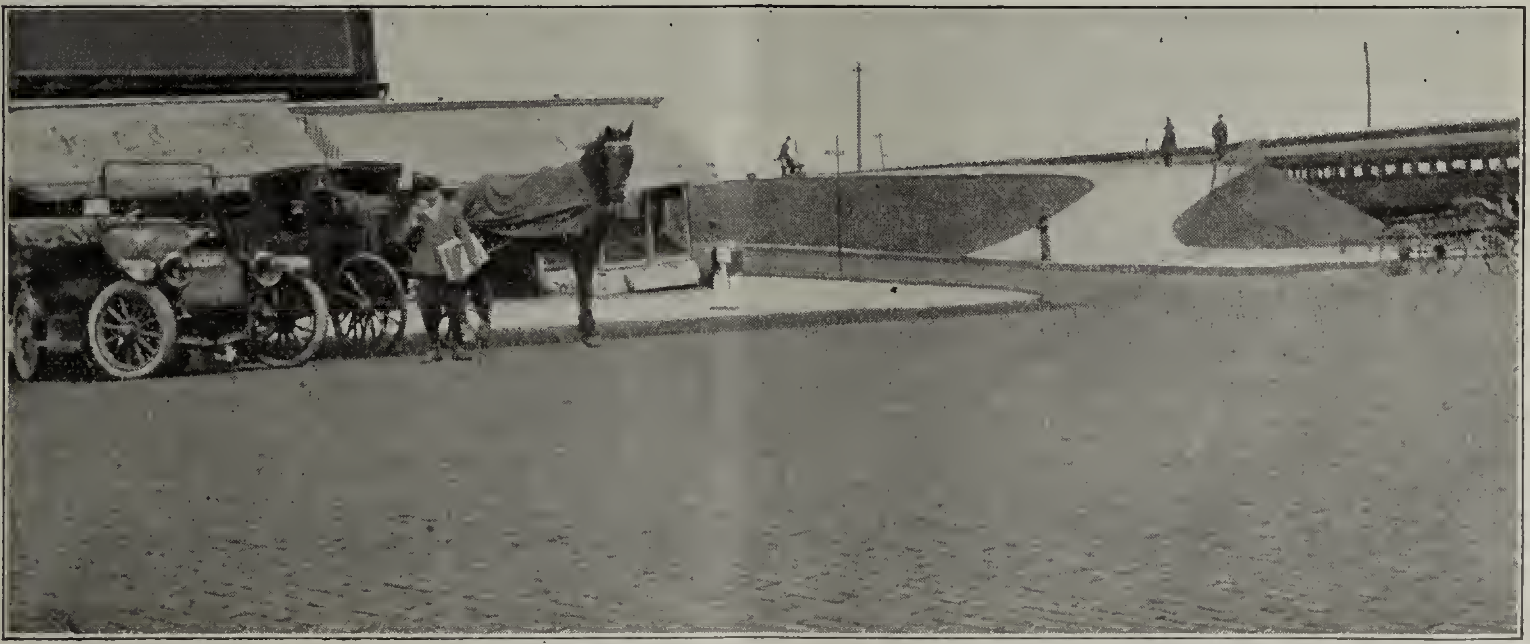
In preferring pitch to cement or sand, the municipal engineer knows that he will get a pavement where every joint is an *expansion-joint*; a pavement in which cracks, breaks, blow-outs are unknown and impossible; a pavement that will not expand and thrust the curbing out of line or damage tracks or manholes; a pavement, in short, that will always be a credit to his management.

The standard pitch is Barrett's Paving Pitch. Look for the label on the barrels.

Booklets on request. Address our nearest office.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis
Cleveland Cincinnati Pittsburgh Detroit Birmingham
Kansas City Minneapolis Nashville
Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING CO., Limited:
Montreal Toronto Winnipeg Vancouver
St. John, N. B. Halifax, S. N. Sydney, N. S.



Wisconsin Avenue, Milwaukee, Wisconsin. Brick pavement filled with Barrett's Paving Pitch.

BURNING CLAY WARES.

(Continued from page 25.)

11 per cent. of steam and 89 per cent. of air. Similarly, 20 per cent. of the weight of the fuel in steam would give 8 per cent. of steam and 92 per cent. of air.

Increased quantity of steam results in a higher hydrogen content in the gas, but the cooling effect of the steam lowers the dissociation efficiency and in consequence there is an increase in the inert carbon-dioxide. Every fuel in producer use is a separate problem, and the frequency of firing, depth of fuel bed, volumes of steam and air, and pressure must be worked out for each fuel.

Steam does not add any fuel value to the gas nor is the ratio of nitrogen and carbon-dioxide in the waste stack gases in any way changed as a gas analysis will show. If a producer is blown with air in large volume under high pressure, we would have the condition of a blast furnace—high temperature, excessive radiation loss and molten slag, which are impractical in a producer. Steam in dissociating takes up this excess sensible heat, converts it into latent heat and conveys it to the kiln without loss, which is an essential factor in ceramic work where the kilns are necessarily some distance from the producer. At first glance, one would say that the reduction in volume of the inert nitrogen would give a greater heat return from the fuel, which would be indicated by a higher ratio of

$$\frac{CO_2}{N}$$

in the stack gases. Let us assume that the combustion is pure carbon and air. The ratio of

$$\frac{CO_2}{N}$$

in the burned gas would be the same as

$$\frac{O}{N}$$

from the air, namely,

$$\frac{21}{79}$$

by volume. This would be the ratio, whether the combustion was complete in the producer or only partial in the producer and final in the kiln. Suppose we have pure water gas with which there is no nitrogen. The reaction producing the water gas will be:

$$C + H_2O = CO + 2H$$

To burn the resulting gases, we have:

$$CO + 2H + O_2 = CO_2 + H_2O$$

Thus it is seen that two volumes of oxygen are required in the secondary (kiln) combustion. The reactions without the water gas are:

$$(1) \quad C + O = CO$$
$$(2) \quad CO + O = CO_2$$

Two volumes of oxygen are required in either case and with it will be corresponding volumes of nitrogen. As we increase the steam, we decrease the nitrogen in the primary (producer) operation, but correspondingly increase it in the secondary (kiln) operation. The ratio of carbon-dioxide to nitrogen in the stack gases is the measure of efficiency of the combustion, and it is constant for any fuel, regardless of the variations in the producer operations. It varies, of course, with excess or insufficient air in the secondary combustion, and herein is its value as a measure of efficiency. It is also affected by any free air passing through the producer, but this is a small matter.

The temperature of the gas leaving a producer in the ceramic industries varies from 700° F. to 1,500° F. The higher the temperature in the distillation zone which governs the temperature of the exit gas, the better the distillation of the hydro-carbon products. On the other hand, it increases the radiation loss from producer and flues leading to the kilns. The temperature is limited by the character of the coal, but in many instances higher temperatures could be used if it were desirable to do so. One authority places the most efficient temperature between 800° F. and 900° F. In another very successful operation, the temperature of the gas at the kiln mouth was over 1,100° F.

There is another consideration which makes the exit temperature important and which governs or should govern the degree.

Tar comes from the distillate products and is heavier and greater in quantity at low temperatures, and to avoid this we should have a high temperature.

Soot comes from the cracking of carbon-monoxide and from this gas it is a maximum around 900 degrees, and practically eliminated at 1,800 degrees, which again points to a desirable high temperature, but soot also comes from the cracking of the distillate gases, and from these gases it is in excess at high temperatures and more voluminous in many instances than the soot from the carbon-monoxide.

We endeavor to regulate the temperature to get minimum tar and minimum soot, which for the average bituminous coal is around 1,000° F., although at this temperature we get the soot from the carbon-monoxide, which we must stand. The temperature which gives a minimum tar and a minimum soot is called the neutral temperature and must be determined for each coal by actual test.

Nearly every one emphasizes the importance of the sensible heat in the gas in securing maximum kiln temperatures. This is beyond question, if it be a choice between losing it by radiation or utilizing it in the kiln, but if it is a choice between conveying it to the kiln as sensible heat or as latent heat, the latter has the advantage because there is no radiation loss in latent heat. Every producer gas user is familiar with the tar and soot trouble, the clogging of the flues and interruption of the kiln operation in frequent burning out to clear the flues, and the annual job of going through the flues with chisel and hammer to cut out the hard accumulation of residual carbon, and each would welcome an operation which would successfully overcome these troubles. The process of washing the gas necessary for power gas loses the sensible heat as well as the value of the tar products and is not to be considered in ceramic work. Nor is it practical to use the double producer—one using bituminous coal and the other coke, taking the gases from the former through the latter. As the by-product industries develop, by-product coke may become available in competition with raw coal, but the time is not yet come. The process must be one which will take the gases from the producer coal and clean them, and put back into the producer the sensible heat in pre-heated air and steam. This would enable us to increase the steam, and by means of it, convert the additional heat into latent heat to be conveyed to the kilns without loss.

This problem of double operation in a single producer has not been solved, although several producers have been designed which have met with some success and merit recognition. The principle of the most promising type is the introduction of a fire clay cylinder or retort in the upper part of the producer through which the coal is fed. The hot gas escaping from the producer surrounds this cylinder and heats it and the coal within, thus causing distillation of the volatile gases. The distillate is drawn off from the top of the cylinder and piped to the bottom of the producer and put back into the producer with the steam and air. The producer is a combination of a gas retort and a coke producer. Theoretically, it looks good, but the practical man can see several difficulties in its operation.

(To be continued.)

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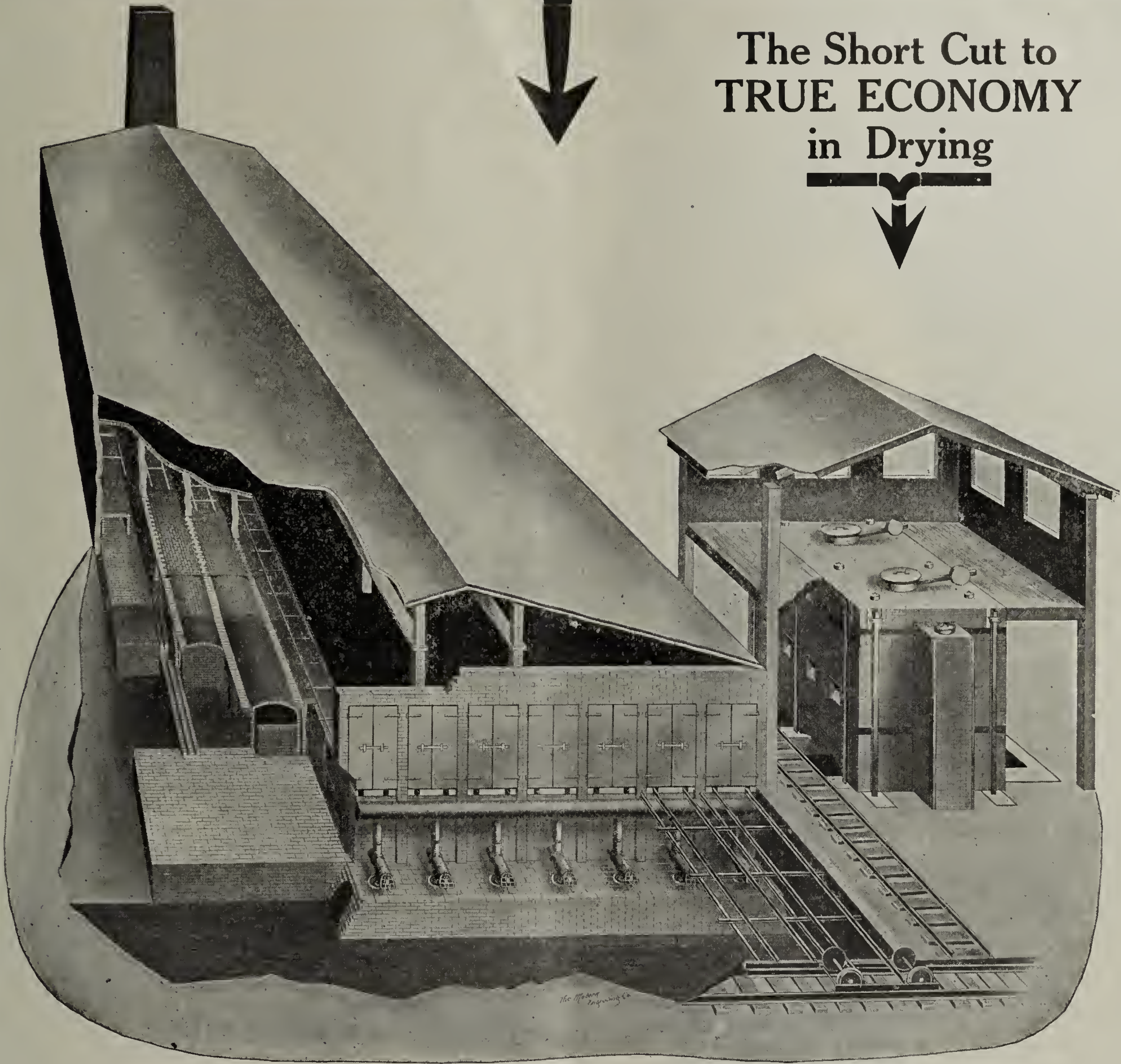

It saves fuel and labor—both very important factors in brickyard operation today, and it can be applied to any type of direct heat dryer at a surprisingly low cost.

The illustration above gives a general idea of the simplicity and compactness of the system when done the "MECO" way, and which is particularly efficient because *we know how it should be done.* Our thoroughly organized and highly proficient engineering department is at your service for further details.

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SEEN IN NEW JERSEY.

MANUFACTURING CONDITIONS in New Jersey are not entirely satisfactory. Labor is scarce and few yards are able to secure sufficient men to run to capacity. Those who are running thus have a good business and orders are ample to carry out all the stock as fast as it is made. Sometimes they take down the kilns before the heat is out to enable deliveries. This seems to hold good in most parts of the state, and is partly due to the fact that the output is short and buyers find it necessary to take the brick when they can get them in order to insure getting them at all.

Along the Hackensack not more than half the yards are operating to capacity and some have not opened at all. The season is one of the slowest in the vicinity in years, and much of it is due to the labor shortage. The yards in operation are enjoying a good business and could sell more than they do now if the stock were obtainable. Prices are around $10.00, some going below this figure, but in the main $10.00 is a fair quotation. At this figure makers are selling all they can turn out.

In Paterson the situation is somewhat restricted at the time. A number of large buildings are in process of erection, but the brick required has all been purchased and recent orders from this vicinity are not as liberal as they were earlier in the season. This is partly due to the conditions in general business and partly to the fact that investors are hesitating until they are a little more certain how they are going to fare with a war going on in which the country is engaged. The contracts already let will be completed, but thus far no one has given out any important contracts in either June or July thus far.

The Hackensack Brick Company, of Hackensack, has adopted motor delivery and handles its brick within a reasonable distance. Many others are considering this method and some will undoubtedly adopt it for what may be termed nearby delivery in the near future. It seems that motor trucks, provided they can be obtained, are the only fair solution of the problem now known.

In the Raritan section most of the plants are operating close to capacity and find a good sale for their product at around $10.00. Buying is for delivery in Newark and New York. Newark is developing very fast this season and requires a great quantity of brick which come from the Raritan district. The way Perth Amboy is hurrying ahead is astonishing, too, but it emphasises the fact that all New Jersey is growing beyond the expectations of investors and others who have followed the situation here pretty closely for years. The establishment of many new factories and other enterprises calls for a great deal of new structural work and brick men are getting their share of the trade.

Newark itself is perhaps the fastest growing community in the state. It is admirably situated and since it developed the port along the Passaic and Hackensack rivers it offers facilities which equal any of the ports along the coast for shipping. The future promises still further development of its facilities. It is buying great quantities of brick and architectural terra cotta, most of which are furnished by New Jersey plants.

Jersey City is growing fast, and many new buildings are now in process of erection, with more to come in the near future. It is one of the great centers of the state and during the past two or three years its use of burned clay has been very large and it still grows. It is next to Newark in size and in development as well.

In the smaller communities along the Hudson river the growth is getting beyond the expectations of most of those interested in them and they are all becoming converts to burned clay.

The fact that steel is to be commandeered for government purposes will have a tendency to increase the use of burned clay in this vicinity where low buildings are the rule instead of the high ones which have become so common in the large cities. With labor scarce it is difficult to say where brick makers can increase their output.

A. L. B.

PACIFIC NORTHWEST CLAY NOTES.

THE GENERAL building situation in the Pacific Northwest is satisfactory. In some sections it is good while in other it is more or less poor. Taking the building permits of the large cities of the Pacific Northwest as a basis, Seattle gained in May 101 per cent over last year, Spokane gained 242 per cent., and Tacoma 32 per cent., while Portland lost 26 per cent.

	May, 1916	May, 1917
Seattle	$504,365	$1,014,070
Portland	478,885	377,245
Spokane	139,305	475,310
Tacoma	88,815	117,549

The labor situation among the brickyards is bad, and labor is very scarce and the wages paid this year are from 50 cents to $1.00 per day higher than last year. Fuel is also much higher. Slabwood which could be bought a year ago for 90 cents at the mill, is worth anywhere from $2.50 to $3.15 per cord. Oil is nearly double in price, and quoted at $1.38 at the large distribution points.

The Oregon Clayworkers Association have taken steps to protect themselves against too low prices for brick and tile, and common brick is now sold at $10 all over the State.

The Pacific Stoneware Company, of Portland, is very busy at their plant. T. S. Mann, their manager, is working over time in order to catch up with their orders.

The old stoneware plant of the Clay Products Company, of Spokane, has been sold to C. P. Oudin and will be dismantled.

One of the largest order for brick was booked by the Seattle Brick & Tile Company. It calls for three million brick for the substations which the Chicago, Milwaukee and St. Paul will build in connection with the electrification of their line from Seattle to Othello.

The Washington Brick & Lime Company, of Spokane, is furnishing the sewerpipe tile for the new 48-inch storm sewer in Butte, Montana. It will require 40 carloads to fill the order. The same company has also another order of 15 carloads for Helena, Montana.

The Denny-Renton Clay & Coal Company are operating their Image, Wash., plant full force and Manager Harold S. Smith states that business is much improving.

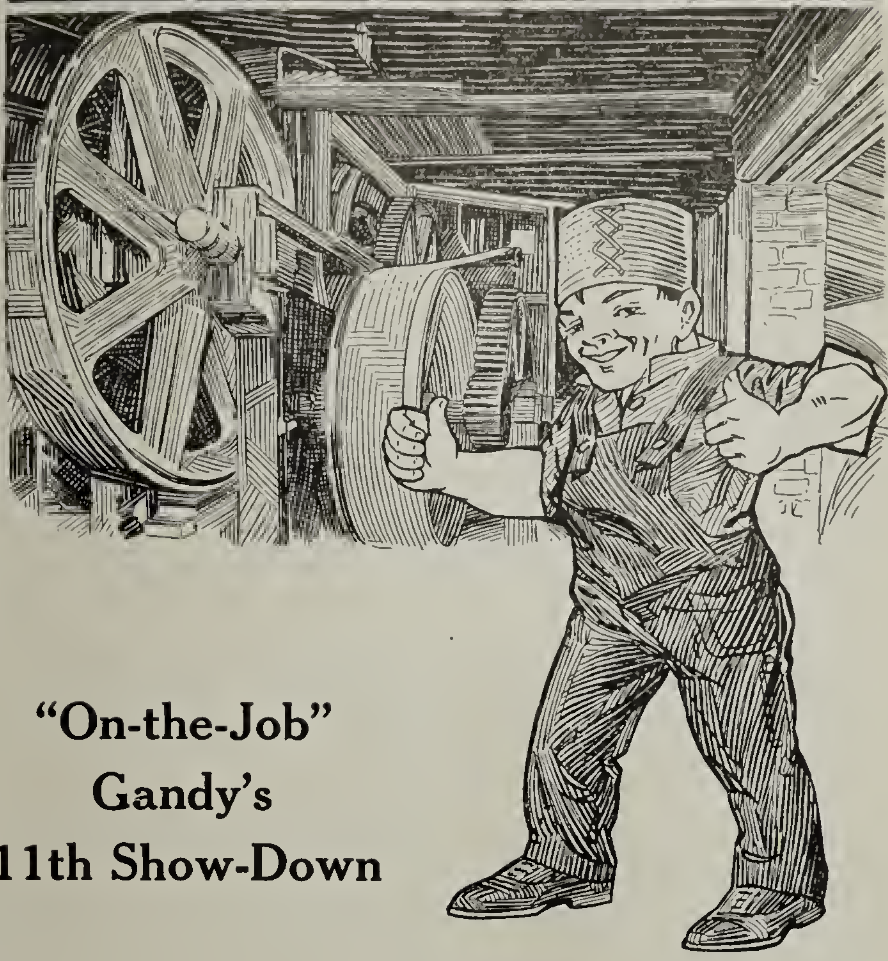
The Salem Tile & Mercantile Company, of Salem, Ore., have changed from steam to electric power by the installation of a large motor. All their machinery is now driven electrically. They are doing a large business in silo blocks, and Manager Wilson states they have more business than they can handle.

The Geijsbeek Engineering Company, of Portland, have secured the engineering and machinery contract for the new plant of the Great Falls Brick & Tile Company, at Great Falls, Montana. The plant will be equipped throughout with J. D. Fate machinery. W. H. Shaw, manager of the company, has just finished the building of their eighth downdraft kiln.

The Denison Tile Clay Products Company, of Seattle, have secured the contract for fourteen fruit storage warehouses in the Yakima and Wenatchee valleys. Denison tile is apparently very satisfactory for fruit storage.

SIWASH.

The Bureau of Fisheries tells us about the introduction of whale meat as a part of the menus at Seattle, Wash., and Portland, Ore. Somehow this sounds like a West Coast whopper, but the Department of Commerce is serious about it and predicts the utilization of the meat of whales, porpoises and dolphins.



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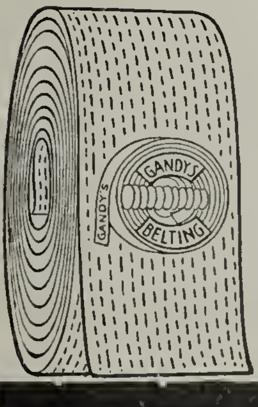
Write for Samples and Prices



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CLAY MACHINERY IN SOUTH AMERICA.

OPPORTUNITIES FOR foreign business open before the machinery man in bewildering numbers. Not alone Russia, as has been pointed out in previous issues, but many other foreign countries, will require American machinery in years to come. Passing by the countries now at war which must rehabilitate and rebuild many others are developing extremely fast under the stress of the present conditions.

South America is a field for exploitation which deserves more consideration than has yet been given to it. The extent of the clay deposits in the countries which are developing so fast in that continent are unknown, but enough is known to warrant the assertion that they are large and the advent of American machinery will mean a tremendously increased output of all the materials used in building which can be made of clay. This, of course, is something entirely beyond the mere output of brick. All sorts of architectural terra cotta, tile, both fireproofing and encaustic, and a score of other manufactures of clay are destined to a much larger use all through South America than ever before.

It was early in the war that a number of vessels bearing clay manufactures of different types were sunk while on their way to South America. It should be noted here, too, as a matter of warning, that cement men have been in that country securing business for a number of years and a great many shiploads have gone to the countries south of the equator in the years past and probably the brick man will have to meet quite as fierce competition down there as he does here in the years to come. Everywhere the cement man is lying in wait for the burned clay man and everywhere the competition must be met regardless of whether the fact is palatable or not. It is one of the contingencies of the trade.

But leaving aside this unpleasant phase of the development of business in that vicinity one may point out with emphasis that the machinery men are allowing a favorable opportunity to slip away from them if they do not investigate the market before the war closes and before foreign machinery makers are in position to resume their activities. At present they are too busy about other matters, while the machinery maker here is in position to investigate markets and make connections, extending his business as circumstances admit. It is true that many machinery makers are overloaded with orders for their own country now and perhaps cannot take on any more, yet it would seem as though an understanding of possibilities might lead to developments which would benefit the trade in this country, while it opens trade in a country which is beginning its growth.

South American cities are marvels of development. In some of them the buildings are finer than they are in this country, with perhaps a few exceptions, and naturally builders have liberal use for a great quantity of the most artistic building material. It is here that the machinery man finds his opportunity. He can supply the machinery for making those materials on the ground. And probably if he does so he will benefit rather than injure the export trade, while it is a certainty that he will benefit the country there since it will open another line of trade for the inhabitants of those regions. Much good development is awaiting the exploitation of the resources of more than one South American country.

Much of the future depends upon the work that is done now. If the opportunities are allowed to slip away without adequate investigation, if manufacturers of the type of machinery wanted accept the little business they have and feel satisfied with it the outcome will not be of consequence, but if they seize

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A-428 (March, 1916)

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the opportunity presented and develop the business with the territory which lies ready to hand they will secure the cream. All South America is looking toward this country now much more favorably than it ever has before and its future development rests largely with North America.

It would seem as though American capital will be invited there after the war ends and it is certain that many buyers from South American countries are in the markets of North America now because they cannot obtain what they want abroad. But once they learn to come this way the advantages of distance of shipment and various other important factors will be so great that they will continue to come here. The machinery man can benefit by this change in trade directions as well as others. It is a matter of seizing and developing opportunities rather than anything else which is essential for this desirable consummation of present tendencies.

Machinery men should not suppose for a moment that the nations of Europe are intending to allow the South American continent to be exploited by American manufacturers without a struggle. They will be prepared for the greatest effort they have ever exerted as soon as the close of the war releases their facilities for the production of engines and goods of peace. Then will come competition beside which the effort made before the war began will seem as child's play. They are not planning to relinquish all profitable openings without a fight. If, then, the American manufacturer can secure some sort of a foothold now he will be in position to carry on the work with less danger of losing the trade when the war is over.

Travelers lately returned from South America tell of wondrous development and business opportunities which will rank with any heretofore known. They say that the entire South American continent is alive with energy and that very many of the leading business institutions of the various countries are looking to North America to satisfy their requirements now.

The hint contained in this condition is worth much to those who will begin operations to take advantage of such opportunities as come to them. It is no longer a question of doubt. It is fact and the sooner those who can supply that trade are awakened to the chance that is offered them the better it will be for them and for their business.

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The advantage of having a trained organization for using convicts on road construction is well shown by a recent instance where a road was greatly needed for military purposes. This particular road is a link in the system designated for improvement by the state highway department, but money for the work had not been appropriated. It is very necessary for the service of one of the camps now under construction and funds for its improvement were available from the appropriation for that camp. The work is greatly aided, however, during the prevailing scarcity of labor in that neighborhood by the fact that a large number of convicts can be assigned to the job under foremen accustomed to manage such labor. The help to the nation in an emergency, which this training in convict road building affords, ought to be taken to heart by the authorities of those states which have not made a good trial of such highway construction. It is entirely successful, not only in the South, but also in California, Washington and Colorado. If other states will follow the lessons of the experience gained there, they may expect equally good results, and their road building program need not be seriously checked. Incidentally, this use of the convicts, making them an asset instead of a liability of the state, is strictly in line with the urgent call for the utmost economy in the administration of public affairs at the present time.

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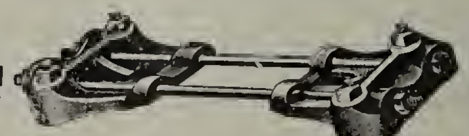

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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol LXVIII. INDIANAPOLIS, IND., AUGUST, 1917. No. 2

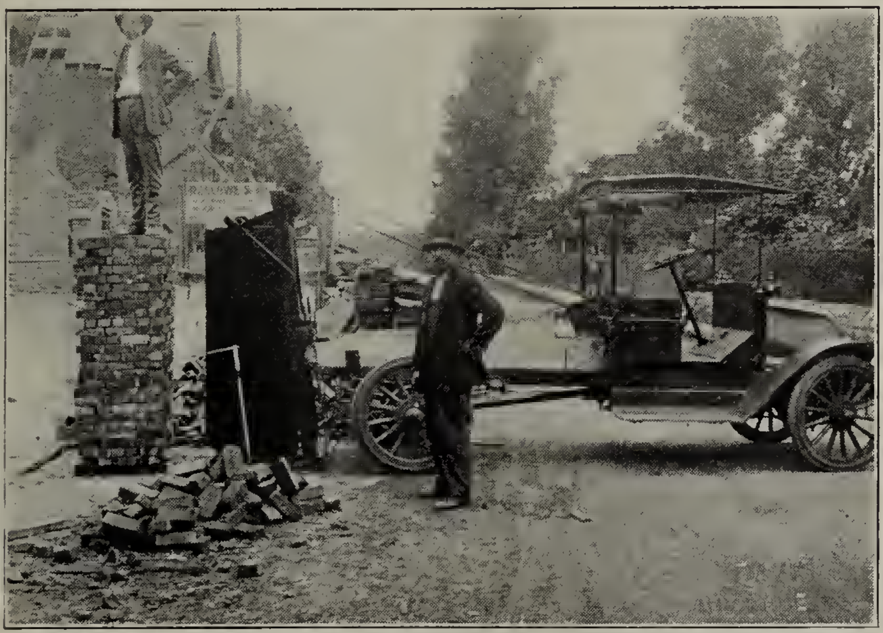
Written for The Clay-Worker.

HANDLING BRICK IN BULK.

Utilizing Motor Truck for Delivering Brick From Plant to Job.

IF HE WHO CAUSES two blades of grass to grow where but one grew before, is a benefactor, how shall we class the modern inventor who by clever mechanical means enables one laborer to do the work of several; or makes easier, surer and quicker the labor required in the production of necessities? In these strenuous times when our young men are being called to arms, leaving the work in which they have grown skillful to less experienced and consequently more inefficient workmen, labor saving devices are more valuable and desirable than ever before. For this reason we are pleased to bring to the attention of the readers of The Clay-Worker a new method of delivering brick from the factory to the building site.

We are indebted to R. A. Fontaine of Roanoke, Va., for the accompanying illustration of the auto truck and brick carrier by which brick are delivered more quickly and with less trouble than heretofore. The method of handling the brick is such that there is no loss by breakage, as is the case when the brick are dumped in the ordinary way. In the operation illustrated, the truck used was a little one-ton International made by the International Harvester Company. The body which contains the brick is placed on end in the kiln, and the brick hacked in same by hand in the ordinary way. Then the truck picks up the load in about a minute's time. In this instance the load was driven three miles to the building where the pictures were taken and made the trip in a fraction less than fifteen minutes, over some rather rough roads and hills. The load consisted of some 650 standard size building brick weighing five pounds each. The loading and unloading device and body, combined is no heavier than any ordinary truck body. This is evident, for otherwise the little truck could not have made such time with the heavy overload.



The Motor Truck, the Carrier Body, and a Load of Brick Deposited at the Curb.

The hacks of brick shown in the accompanying illustrations are just as the truck left them. Indicating the ease with which the brick are handled, Mr. Fontaine writes:

"I believe a basket of eggs might have been tied to the hack of brick and unloaded, eggs and all, without a mishap."

Of course this device can be used just as advantageously from storage sheds, wharves, cars, or gravity carriers, as from the kiln. The bodies may be picked up by an elevator, crane, derrick, or automobile truck, with no danger of mishaps or breakage of brick. The brick are so clamped at the bottom of the hack that they stay secure in the body until the clamp is released, after which the body may be removed from the hack by hand, derrick, or truck. In some cases, especially the handling of front brick, it may prove advantageous to leave or store the brick in the bodies. If desired, they can be set on railway cars with derricks or cranes and unloaded in the same manner, to again be picked up by trucks and delivered wherever desired. Where the brick are taken from the plant direct to the building site, the loaded body delivers the brick in an upright pile, the empty body being returned for another load. For continuous hauling two bodies are required, but of course in many cases, a dozen or more bodies can be used to advantage. It is claimed that by this method of handling brick, there is a saving of fifty per cent. in labor, and a similar saving in increased capacity, an item of considerable importance, even with a small capacity plant.

We will be pleased to describe and illustrate other labor saving devices which may be used in the manufacture and handling of brick, tile or other clay products. Surely there has never been a time in the history of the clayworking industries when there was a greater need for labor saving devices and economical methods in all branches of the work. There is a scarcity of labor in all lines of industry which in all probability will increase as the war goes on.

Labor problems we have with us always, but they seem more numerous and troublesome now than ever before. The high wages which prevail in this country have mothered many of the inventions in the way of labor saving machinery. Perhaps that is why we lead the world in such inventions. In foreign countries where the daily wage is low, it is not uncommon for women to perform ordinary day labor, but it does not seem that such would ever be the case here in the land of the free. However, if the worst comes to worst, women may seek employment driving trucks or tending machinery and such other work as does not require severe physical effort, it is to be devoutly hoped though, that this will not be necessary and that Yankee inventions will continue to take the place of manual labor and increase the productive capacity in all lines of manufacture that there may be no diminution in the production of the necessaries of life and all that goes to make up the sum of wholesome living.

PLANT MANAGEMENT

By Richard B. Hoehne.

PART VI.

Old-Fashioned Methods Continued.

A MACHINE, or mechanical device need not necessarily be classified as "faulty" or "of old-fashioned type" just because it operates inefficiently; the lack of efficiency may be caused by wrong application or impractical use, in which the machine itself plays no role save that of a silent partner. Nevertheless, it generally gets the blame anyhow, because it offers the least defense.

In support of this theory I wish to mention an incident, where I found an electrical hoist used in a manner and for a purpose which made the outfit nothing less than a big nuisance to the brick company maintaining its operation, in spite of the fact that an electric hoist ordinarily passes as an entirely modern machine, fulfilling all requirements of up-to-date equipment. The hoist referred to had been added as an extension link to an old-fashioned clay hauling system, which thus had received another set-back in efficiency through lack of judgment regarding the proper method to be employed, as will be seen from the further explanation:

Clay Haulage.

The transportation of raw material from the pit to the factory presents a problem that every clayworking plant is confronted with, and which not only requires to be designed individually to meet the particular requirements presented by the local situation, but there is such a possibility that a system of haulage in the course of time may need a radical change, whereas most plants have a growing capacity and the situation of a clay pit will naturally change by reason of the exploitation to which the deposits yield. When the first hole is made in the attempt of starting a clay pit, a double-tracked incline renders a good assistance in furthering this work to the desired depth. The bottom once established, is generally retained at the same elevation throughout the pit, although it seems favorable to work it with a moderate slant, which in time would facilitate to operate the loaded clay cars by gravity from distant points of the bank to the original incline, thus avoiding the installation of extra machinery for pulling the cars forth and back. The use of a steam-shovel makes this measure negligible, for the reason that a car-pulling device can easily be attached to the mechanism of most any shovel, to tend to the operation of the cars by means of cables without requiring separate attendants.

Handling Brick in Bulk—Loaded Truck.

Unloading a Truck.

A case of this kind was presented at the clay and shale pit spoken of. A heavy, three man steam shovel was employed to do the digging, hence a splendid opportunity had been missed by not using it in place of the specially installed electric drum and cable, which served no other purpose but moving of the clay cars to and fro. This is to illustrate how expensive devices are sometimes resorted to where a little common sense used with plant management would suggest simple arrangements, much cheaper initially as well as in the operation.

The criticism accorded this item is not to be mistaken as a recommendation of that method for this particular case, because the system of haulage of which it would have been a link was altogether in need of remodeling, duly called for in my report on the subject. The plant fed by this haulage system had grown into a size consuming 360 tons of raw material daily. Owing to this fact, every department had been remodeled and enlarged to suit the growth of production, while the clay haulage had received no improvements beyond the acquisition of more and larger dump cars, and, after the size of the pit suggested that "something be done," the addition of the previously mentioned electric arrangement. With the latter included, the raw material was hauled over a system, combined of four individual transportation units. The first, already explained, delivered the cars within reach of a steam hoist, being mounted at the entrance to the pit for the sole purpose of pulling the loaded cars by way of a very steep incline out of the pit, and to put the "empties" back into it. Up to this stage the system required two laborers for detaching and attaching the dump cars from the cables, and an operator for each of the two hoists. The third unit, operated with mules, conveyed the clay cars along the surface towards the factory, where they passed into charge of another unit—the fourth—made up of a hoisting drum and the necessary attendants, which completed the cumbersome job by dumping the cars after they had ascended the incline, culminating on the second floor of the factory building.

Judging from the complicated style of this system, the reader may conceive the impression that the haul covered a distance of several miles, while, in fact, it hardly exceeded one-quarter of a mile. This condition was very much in favor of electrifying the whole track, thus making it all one unit, the operation of which would require but one or two men. As the company's electric generator was producing sufficient surplus power to take care of the electrified clay haulage, this system was recommended by me and carried into effect shortly thereafter. The operating expense of the new arrangement is less than one fourth of the former cost, as can be verified from the following calculations:

The Brick Deposited at the Curb.

Truck Ready for the Return Trip.

200 k.w. hours of electric current @ 1½c	$3.00
1 electric operator	2.50
1 helper	2.00
Total	$7.50

Quantity hauled 360 tons daily, thus 750/360 equals 2.08 cents per net ton of clay and shale.

With the old system daily expenses run as follows:

Cost of power for three hoisting apparatus	$14.50
2 mules	1.50
4 helpers @ $2.00	8.00
3 operators @ $2.50	7.50
Total	$31.50

3150/360 equals 8.75 cents per net ton hauled.

Therewith is demonstrated the inefficiency of the former four-unit system. In discarding it, the company saves at least $24 each day, or

24×300=$7,200.00 per year,

which ought to be worth while saving. With the increasing output of the plant, the gains from this new arrangement will grow, and it should be understood that it will facilitate a considerable increase in capacity at but slightly higher operating expense, thus cutting the cost of hauling per ton of clay and shale to a still more favorable figure.

It may interest the reader to learn that the entire installation of the new system required a total investment of close to $4,500.00, which amount was recovered by the higher efficiency of the electrified track in about one hundred and ninety days of operation.

(To be continued.)

CALIFORNIA CLAY PRODUCTS COMPANIES ORGANIZE.

Representatives of several of the largest brick and pottery concerns on the Pacific coast, with a reported capitalization of $12,000,000, met in San Francisco last week and unified interests by forming the Clay Products Bureau, a central organization, which will be devoted to the general promotion of the vitrified products trade. The following officers were elected for the ensuing year: George Chambers, San Francisco, chairman; H. C. Muddox, Sacramento, Cal., vice chairman; Frank Costello, San Francisco, secretary; Geo. D. Clark, Oakland, Cal., treasurer; executive committee, E. M. Durrant, Los Angeles, Cal.; H. J. Crowe, Seattle, Wash.; V. E. Piolett, Spokane, Wash., and Frank Costello. The firms represented in the organization are: California Pottery Company, Steiger Terra Cotta & Pottery Works; Denny-Renton Clay & Coal Company; Washington Brick, Lime & Sewer Pipe Company; Pacific Tile & Terra Cotta Company; Pacific Sewer Pipe Company; N. Clark & Sons; Gladding, McBean & Bro.; H. C. Muddox; Utah Fire Clay Company; Pacific Coast Pottery & Terra Cotta Company and the Los Angeles Pressed Brick Company.

His Hopes.

Father—You have been running ahead of your allowance, Robert.

Son—I know it, dad. I've been hoping for a long time that the allowance would strengthen up enough to overtake me.—Boston Transcript.

WHEN THE PLANT IS OVERTAXED.

Timely Suggestions for the Betterment of Plants That Will Result in Greater Efficiency.

SOMETIMES DURING the busy season even a brick manufacturer reaches that point when the requirements of his trade overtax the capacity of his plant. Sometimes this overtaxing is in one part and sometimes another. It may be the drying or burning facilities or again it may be the manufacturing equipment itself or the power plant. Indeed, most all overtaxing of the manufacturing plant itself generally reverts back to the power plant, for with more power one can get more speed and always push things along. When the limit of power is reached, however, and the machinery begins to drag, then you know you have attained all that is possible, unless there is some means to increase the efficiency of the power plant.

To increase the efficiency at the power end under such conditions is, of course, just as simple as building new kilns or putting in additional machines or anything else, if we take the regular course and make additions to the steam plant, and so on. But these things take time, and what is useful to many a man on occasion is to know how he may increase the power from the equipment he has an do it promptly.

Nearly every modern engine and boiler has quite a large factor of safety in its make-up. That is, will stand more pressure, more speed and more strenuous work generally than it is ordinarily run at; because ordinarily such an equipment is not taxed to its maximum, for the reason that economy in fuel is not obtained in that way. Therefore, we frequently have room to get a little higher service without making additions to the equipment, and generally this addition in service can be had promptly.

There are ordinarily two methods by which one may get additional power out of a given plant, and the choice of methods depends on conditions. One method is by higher steam pressure, and the other is by increasing the speed of the engine.

Taking the first method, that of higher pressure, and we find it is also the simplest one, where the equipment will stand it. If the steam carried has varied, say from 80 to 100 or even 110 pounds, and the boiler is comparatively new and in good condition, it might be tested for higher pressure, and if found safe, have the safety valve set to 130 or 140 pounds, and thus add materially to the pressure and through the increased pressure get more power, provided, of course, the engine will stand for it. There has been quite a tendency of late years to run a higher pressure than in old times, and many of the new and modern power plants have already gotten away from the old low pressure practices, consequently if in a plant of this kind the pressure is already as high as is commensurate with the equipment and surroundings, it is time to take up the other method.

To get additional power by increasing the speed of an engine calls for two things, for the production of a greater quantity of steam at the boiler and for either putting a smaller drive pulley on the engine or a larger driven pulley on the line shaft, so that the machinery may keep at the same speed and the engine increased still higher. This gives additional power in proportion to the increase in speed. There are here and there plants where this method can be adopted to advantage. Plants where there is plenty of steaming capacity, but the engine seems loaded; that is, you can relieve the load of the engine by changing the driver or driven pulley and giving it more speed without increasing the speed of the machines.

Where it is desired to increase the speed of the machines all through the place, then increase the speed of the engine by the simple process of changing the governor, screwing it down, as the engineer would say, and if you have plenty of steam producing capacity at the boiler you are all right, and thus may increase the capacity of the plant clear through.

Sometimes when there is no surplus of steaming capacity in the boiler to warrant the increased speed of the engine, one may help things along by carefully covering and protecting all the steam pipe and exposed parts that cause condensation and loss of heat. The cooler the weather the greater the saving effected by covering all the pipes, but it is cool enough to be well worth while all the time. And where there is any occasion to get more work out of the power plant, one of the first steps should be to see that not only all the exposed parts of the boiler, but every steam pipe, from the largest to the smallest, is carefully covered with insulating material, so as to preserve the heat and prevent condensing of steam. And it saves not only power and fuel, but it makes it easier on the engine, because there is a dryer steam and not the watery mess of condensation from exposed pipes to wash out the oil and cause cutting of the cylinder, as well as reducing the pulling capacity of the engine.

Where it is not practical to get more power out of a plant by either of the methods named, of course it then becomes a problem of putting in additional equipment. Sometimes it will be necessary to add both boiler and engine equipment, and again it may be only one or the other that is required. If a deficiency in power is caused by a too small or old, worn out engine, there may be nothing further needed than a new engine. There are some of the old type of engines that had lots of clearance at the cylinder heads, which were really great steam wasters as compared to the modern engine, and at times where an engine of this class is being used, quite a saving on the boiler end as well as better work at the machinery end may be obtained by simply installing a new and modern type of engine. Again, there are engines that all they need is a better supply of steam, more of it and a higher pressure to do all the work that is required of them. Generally, however, the engine and the boiler equipment is fairly well balanced, and if this is the case and the work of the plant requires running them at their maximum of pressure and speed both, it is well enough to do this for the time being, but while about it also figure on making some additions to the plant the first opportunity, because running continuously at a high tension is not only rather expensive for fuel, but it is likely to wear out the power equipment sooner, and there is also more danger of breakdowns.

So, while it is well to know how to plan and scheme to increase the power facilities when occasion requires, this is but a sort of temporary arrangement that should lead to a permanent increase in the power plant equipment during the next shut-down.

The Prayer of the Nation.

God give us men! A time like this demands
Strong minds, great hearts, true faith and ready hands.
Men whom the lust of office does not kill;
  Men whom the spoils of office can not buy;
Men who possess opinions, and a will;
  Men who have honor, and who will not lie.
Tall men, sun-crowned, who live above the fog
In public duty, and in private thinking.

—J. G. Holland.

BUTTON-HOLE TALKS.

Gates Reminiscences on Childhood Scenes.

AMONG the most vivid pictures that come to my mind, in retrospective mood, is that of a gawky boy dragging large and reluctant feet toward the wood shed. Ordinarily we would say that the feet carried the boy, but not in this instance, the boy drags the feet. They follow him, for a stern father has the boy by the hand and is preceding and guiding the boy toward the wood shed. As they progress the boy is yelling of his wrongs and he don't care who hears him. The father is talking earnestly, and that the boy shall hear him, and he is saying: "This will hurt me more than it will you." This picture comes very vividly to me for I often participated, personally, in the affair. I was the boy with the reluctant feet. I participated, I may say actively. We had no rehearsals as they were all grand stand plays. I knew my part and I never missed it though I never became really attached to it. Our back yard had a bush that grew long, limber and tough switches. I always thought this was a mistake in landscape work, and there were many occasions on which I resolved that when I got bigger I would remove that bit of shrubbery. I mention this because there was some of the bush in this picture, there were cuttings from the bush that accompanied the boy with the reluctant feet and the ingrowing dread. They not only accompanied the boy, but were destined to become attached to him even though he should not feel attachment for them. When the wood shed was reached the costuming for the act began. The buttons were relentlessly and I may say, sternly, unloosened. Parts of my anatomy that I firmly believed nature had not intended for such use were exposed, again repeating the opening line, "This will hurt me more than it will you," and the gymnastic stunt was on. I hated to have father hurt. I hated to have him hurt himself. I would readily have compromised, or have called it all off, indeed I did call, I yelled. I had to and anyway it was wise to do so. Father could only judge as to whether the application was sufficient by my yells, so I yelled plenty. I had to be tactful for if I yelled before the tingle he would get wise and discount the yell. I yelled on my own account and, remembering what he said about its hurting him more than me, I was sorry for him and I yelled some on his account.

W. D. Gates.

When we emerged from the wood shed, Father all wet down with my tears and I with a rush of blood to that portion of my anatomy which I had supposed was intended solely for placing on a chair, both of us were sad and both repentant. Each had done his duty. The slate was wiped clean till the next time. True I had my doubts as to his remark. It hurt me so much that I couldn't see how it could hurt him more. To my mind my end of the switch was the warmest.

As the years have passed, the picture has survived, as I have said, and more mature judgment has convinced me that the remedy was needed and indeed should really have been more liberally used.

Having used the same remedy on my own children, and having told them in the same way that "it would hurt me more than it would them," I have learned more as to that real hurt which he bore in causing pain to one he loved. Those hands that fondled me and petted me, and yet could bring themselves to chastise me, were years ago folded over that honest and loving heart and laid to rest. The years have taught me how much harder it is to do the things that hurt than it is to do the things that please and cheer. Yet they must be done.

Now I am fondling members of the third generation, but I don't want their fathers to hurt themselves as my father hurt himself and as I hurt myself. GATES.

Written for The Clay-Worker.

NEW YORK AND VICINITY.

GOVERNOR CHARLES S. WHITMAN has selected John B. Rose, of the John B. Rose Company, Roseton, to raise and organize a home guard unit of 1,100 men, which will be required to perform certain guard duty after the National Guard is withdrawn from the waterworks and public buildings to go to the training camps of the South.

John B. Rose is a name which means much in the brick business about New York. It has meant much in the state senate, of which he was a member for several terms. And it will mean much in the organization of this unit of guardsmen. He already holds a colonel's commission and his work for the state has been endless and valuable. Brick men along the Hudson realize that many things which have benefited them have originated in the same way and they will look for interesting results from this new appointment.

So far as New York is concerned the discussion of brick pavements seems to have ceased. Rarely is anything heard about them in these times and pavers, when making specifications include only certain materials which are patented, or are made by special process and do not always come up to the standards promised or required. But the failure in one locality doesn't prevent the engineers in others committing exactly the same mistake under substantially similar conditions elsewhere. It seems very difficult to convince paving contractors that brick is the best material to use for this purpose, even though it is more costly when first laid down than some other patented materials. New York requires much paving and a considerable share of it might well be brick, with profit to the city in the way of reduced expense and with satisfaction to the users. But the powers that be, now as always, insist upon some other variety of pavement, and the city gets the usual supply of lemons through the course of the experiments.

Compared with last month general conditions in and about New York are not quite up to the standard, which has been set through successive months of great building activity. The percentage is variously estimated, but perhaps it doesn't really matter how much it is, sufficient to say that it is enough to make a good deal of difference in the price of brick.

The result is that common brick have declined in price, and it is now possible to buy them at $9.00, which is the low point thus far this year, and some even say that $8.50 has been accepted. But this assertion lacks confirmation and must be received with some degree of reservation. The tendency is downward, however, and the price may reach a lower level before the decline is checked.

Of course at the price of labor and other production costs the maker gets no profit from brick at that figure, and he may be pardoned if he decides that discretion is the better policy and refuses to invest money in making brick which he stands very little chance of taking out. They are not operating more than a fraction of capacity in many instances and it wouldn't take much more to cause them to close down entirely.

Over in New Jersey conditions are similar. The price of brick is governed by the price in the New York market and makers can get no more than New York buyers will pay. The result is that along the Hackensack the yards are only partially busy, and so far as can be learned few are undertaking any important developments anywhere in New Jersey.

BURTON.

BRICKWORK TESTS AND FORMULAS FOR CALCULATION

BY H. KREUGER, PROFESSOR AT THE TECHNICAL HIGH SCHOOL IN STOCKHOLM

Translated for The Clay-Worker by G. Wson Cronquist.

PART II.

5. Influence of Age.

The strength of the brick does not generally increase with the age, which is, however, the case with mortar. Thus, it is evident that only through the hardening of the mortar the age may have any influence on the strength of brickwork. Therefore, it must be examined in which manner the strength of mortar increases with the age. You must not, however, make any immediate inferences only from the results, obtained through experiments with cube-formed specimens of mortar, as the absorption of air and carbonic acid is not equal to that occurring with mortar in thin joints of brickwork. The lime-mortar is growing harder the thinner the brick wall is and the more porous the brick are. Experiments have shown that by a common wall of brick made in lime-mortar, the percentage of carbonic acid at the outer edge was 2.1 per cent. after seven days and 5 per cent. after one year, and in the middle of the wall only 0.18 per cent. after seven days and 3.3 per cent. after one year.

Accordingly, the strength of the mortar is very unequal in the different parts of the wall, and the solution of this question meets with great difficulties, as to the theoretical point of view.

Therefore, I have, through immediate experiments, tried to state the increase of strength, meanwhile the age of the experimental pillars was not more than one year.

At the experiments, partly the strength of specimens of the mortar after twenty-eight days and one year, and partly the strength of the brickwork were stated after the same periods. Hereby it is to be remarked, that, as already mentioned, the strength of the mortar in the joints of the brickwork must not be considered to be the same as the compressive strength of the specimens, even if this be the only probable basis for comparison.

The size of brick used in this case was 270x130x95 mm.

Indication	h : b	Compressive strength of the bricks in kg/qcm	Thickness of joints mm	Compressive strength of the specimens of mortar in kg/qcm		Compressive strength of brickwork in kg/qcm		Increase in per cent
				28 days	One year	28 days	One year	
I $A_h + a$	1,2	220	10—12	4,8	12,7	110	129	17
I $A_h + b$	1,2	220	10—12	6,5	15,6	117	124	6
I $A_h + c$	1,2	220	10—12	33,0	44,0	143	151	6

According to the formulas above stated, the theoretically calculated compressive strength at the experiments with the indication

I $A_h + a$, after 28 days will be

$$k_m = \frac{220\,(6+\frac{1}{10}\times 4,\ 8)}{10+4\times 1,\ 2} = 97 \text{ kg/qcm.}$$

and after one year

$$k_m = \frac{220\,(6+\frac{1}{10}\times 12,\ 1)}{10+4\times 1,\ 2} = 108 \text{ kg/qcm.}$$

The calculated values differ from the real ones in the above stated manner. The proportion between both the values agree rather well with the reality, in all cases as well as may be expected as to experiments with brickwork, when taking in consideration that for each brickwork specimen only six brick were used in this case, and that also the difference in strength of each special brick does not turn out as well as is the case with pillars consisting of a great number of brick.

Some special experiments show that the increase of compressive strength during one year was very small.

It may be said that the compressive strength of brick walls of usual thickness with lime mortar during a time from seven days to one year does only increase from about 5 to 20 per cent at the utmost. As a mean value, 10 per cent. may be stated. The elasticity of the brickwork, on the contrary, changes very much during the same time.

Reinforced Brickwork.

At the compression of brick pillars there arises generally vertical breaks, as will appear from Figs. 5 and 6.

This fact caused me to lay in thin reinforcing irons in the horizontal joints in order to obviate such breaks; it has also proved that with such reinforcement, very strong pillars may be obtained.

Different reinforcements were used for the experiments.

(a) Quadrangularly arranged hoop-irons;
(b) Hoop-irons arranged cross-wise;
(c) Round irons arranged quadrangularly;
(d) Round irons arranged crosswise, and
(e) Wire-net.

Here cement-mortar was used, partly owing to its great compressive strength, partly owing to its capacity in protecting against rust.

When a prism is compressed, it becomes shorter, and at the same time the vertical surfaces are displaced outwards (Fig. 7). Horizontally arranged irons thus will get tensile strains and counteract such a lateral extension.

The experiments showed that wire-net-reinforcement is to be preferred. Whatever sort of reinforcement you may choose, the look of the break, however, will be quite another than when using no reinforcement.

Fig. 8 shows a pillar with quadrangularly arranged reinforcement of round bar-irons, and Fig. 9 a pillar with reinforcement of wire-net. In Fig. 9 the shear surface will clearly be seen. A comparison between Fig. 9 and Fig. 10 will be especially instructive; last figure showing a banded concrete pillar.

The following statement shows the influence of different reinforcements on the compressive strength of the brickwork:

Strength of the bricks = 373 kg/qcm.
Strength of the mortar = 80 kg/qcm.

Indication	Height cm	Breadth cm	Reinforcement	Strength of brickwork kg/cm^2	Increase of strength by using reinforcement in per cent.
V D, c	198	24	No reinforcement	87	—
VI D, c	204	24	Quadrangularly arranged hoop-irons 1.25x12 mm.	135	55
VII D, c	196	24	Hoop-irons arranged crosswise 1.25x12 mm.	152	75
VIII D, c	205	24	Wire-net of 1.2 mm. thread and width of meshes = 12 mm.	163	88

The compressive strength may thus be increased more than 100 per cent. compared with pillars without reinforcement.

I intend to make an extensive series of experiments in order to examine how the compressive strength increases with different strong reinforcement and also the theory of the calculation.

The costs for the reinforcement are inconsiderable in relation to the results obtained. I have already, in many buildings, profitably used wire-net-reinforcement. Especially strong

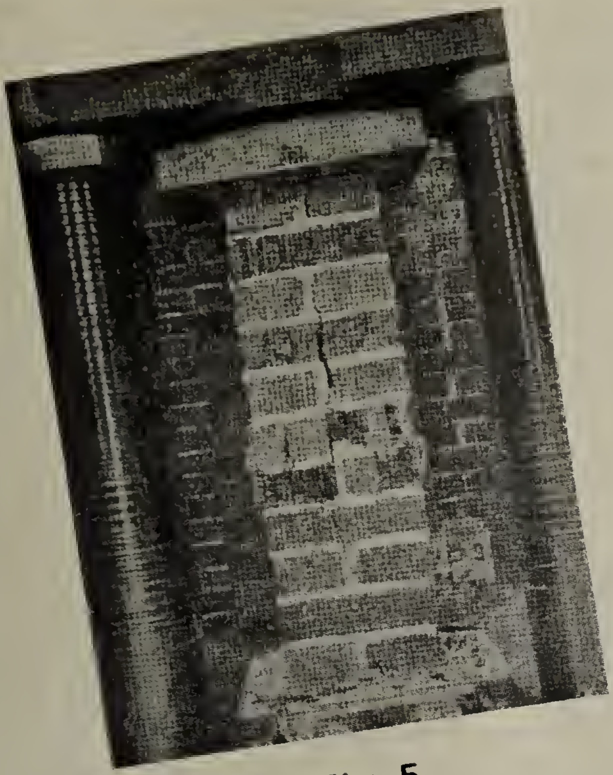


Fig. 5

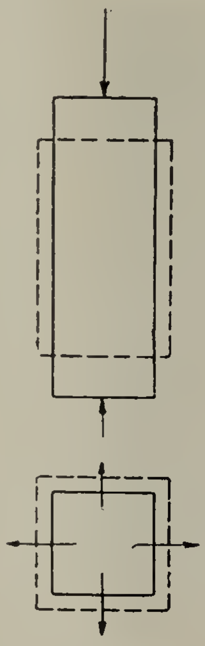


Fig. 7

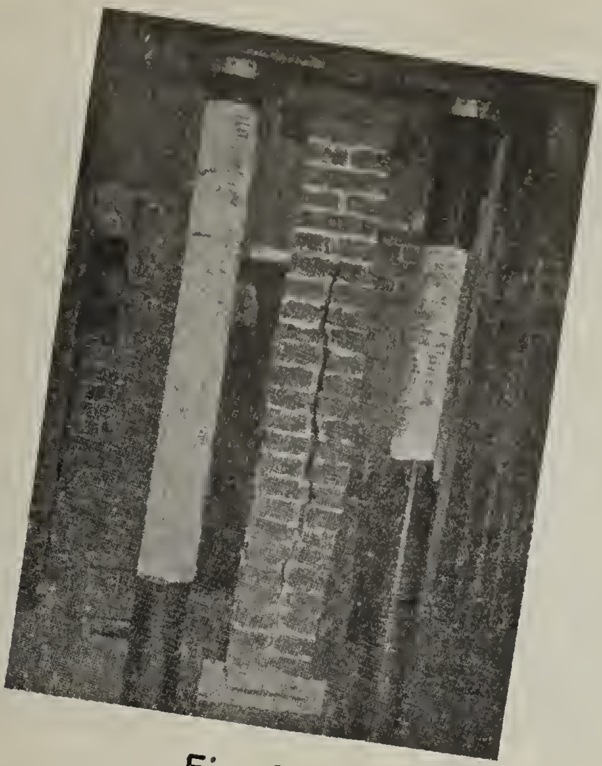


Fig. 6

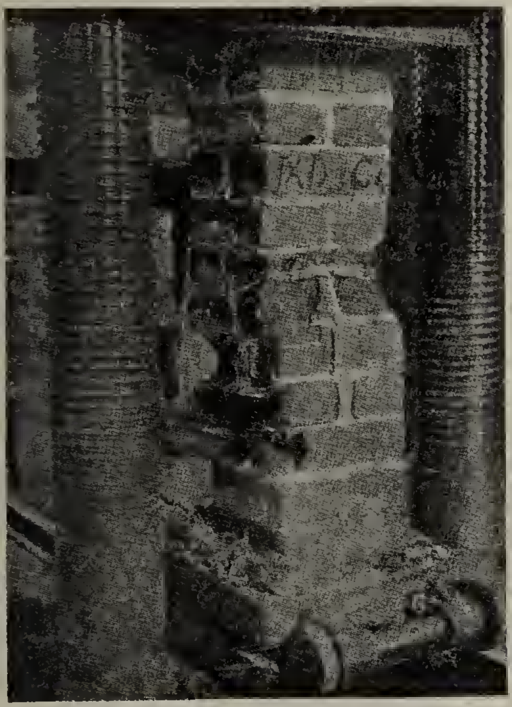


Fig. 8

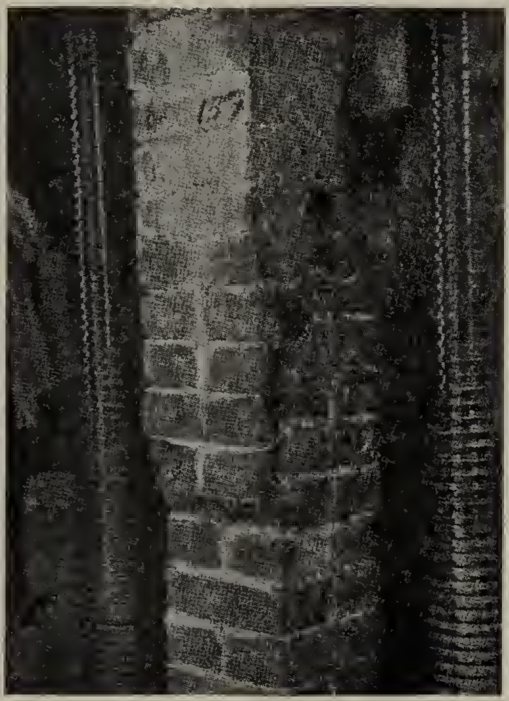


Fig. 9

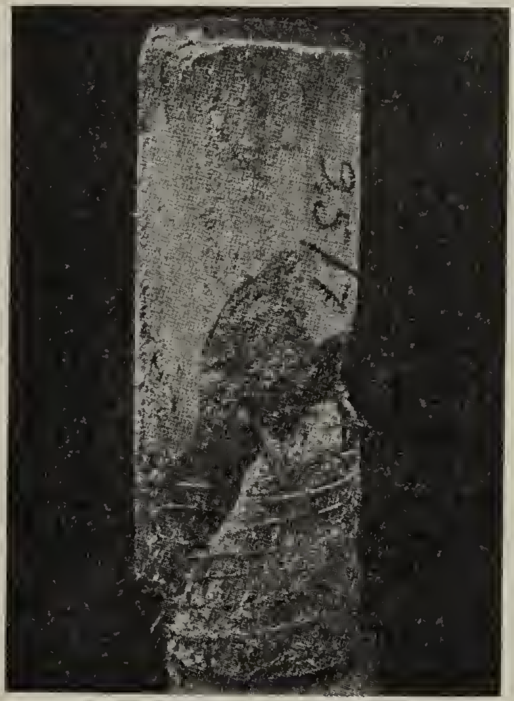


Fig. 10

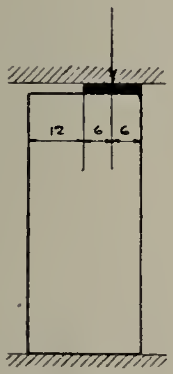


Fig. 11

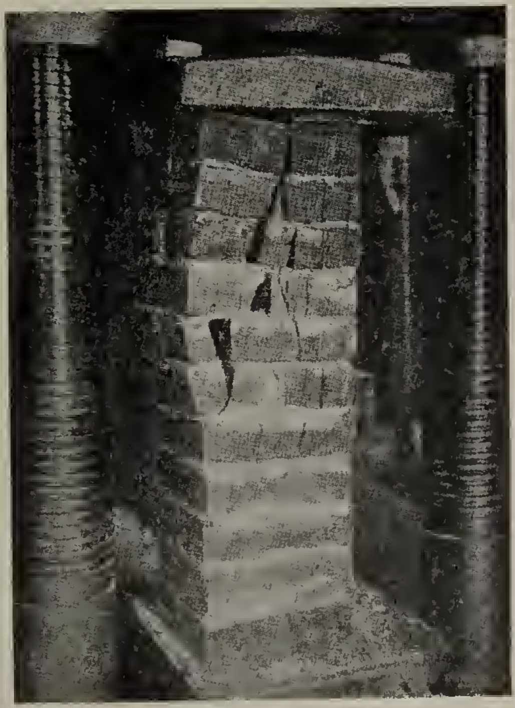


Fig. 12

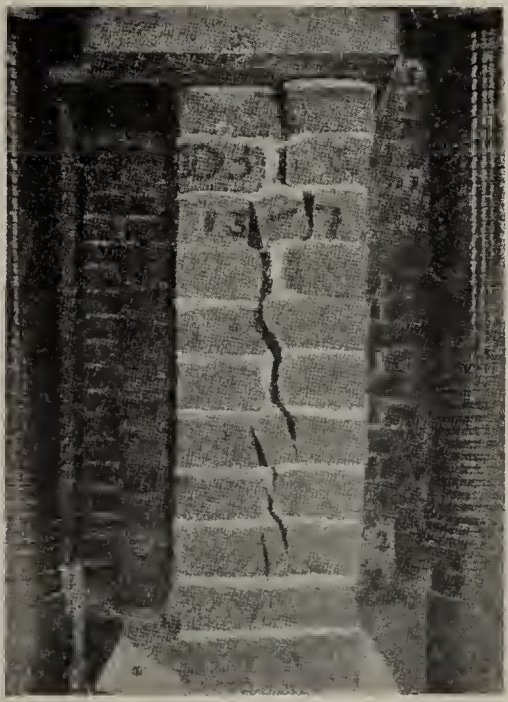


Fig. 13

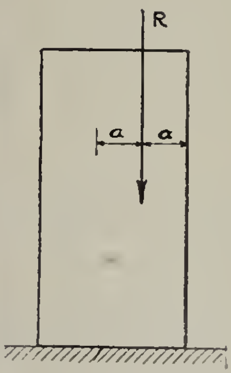


Fig. 14

pillars are obtained with clinkers, cement mortar and wire-net-reinforcement. Such pillars can compete with reinforced concrete columns, even banded columns.

7. Influence of Eccentric Load on Brick Pillars.

At eccentrically loaded pillars, the results from practice and theory are most often quite different. The reason hereof is, as in all the like cases, that the theory is wrong based. It is generally provided that through the distribution of the strains in a section of brickwork, being caused by compression and tension, follow the straight line formula, as well as the modulus of elasticity for compression and tension are considered equal. These presumptions do not agree with the reality, but give rise to the old rule that the line of pressure at a square section must be within its middle third, that no tensile stresses will arise.

Experiments have proved, however, that the line of pressure may be found outside the above mentioned limit, without occurring tensile stresses.

In order to examine the influence of eccentricity, pillars were made, said pillars being, for comparison, centrically and eccentrically loaded. The eccentrical load was applied in such a way that the resultant worked upon the fourth part of the section of the pillar.

Fig. 11 illustrates this placing of the load. Figs. 12 and 13 are photos, showing the course of the break.

The experiments show:

h:b cm	Strength of bricks kg/cm²	Strength of mortar kg/cm²	Centrical kg	Maximum load Eccentrical kg
84x24	284	3.5	35.700	16.700
84x24	373	3.5	49.000	21.400
79x24	502	3.5	74.000	34.000

It appears from the experiments that, by an eccentric load over half the surface, a maximum load is obtained, which is somewhat smaller than the half of the corresponding load by centric placing.

The usually accepted theory with straight-lined distribution of the strains results in a considerably smaller maximum load for eccentrical weight. Breaks of tensile stresses could not be proved by the experiments.

From the experiments stated above and from such made afterwards, the following manner of calculation ought to be stated: If the distance of the line of pressure from the nearest outer edge be indicated with a (Fig. 14) and if from R an equal piece be removed, the pressure may be considered to be evenly dispersed over the surface (2 a) times the breadth of the pillar. The allowed compressive strength is to be considered about 10 or 20 per cent. smaller eccentrical than by centrical load.

By the above stated, I will, however, not lessen the value of the theoretical development of eccentrically loaded pillars. On the contrary, I hope that the theory will be brought forward, if only the suppositions are right.

CARS.

Business is handicapped and industry is held in check somewhat these days by a shortage of cars. We are told that there is today the greatest car shortage ever known in the history of the country. We know, too, that the difficulties of transportation are making serious trouble in some lines. Perhaps the most striking example is furnished by coal which is dependent directly upon immediate transportation as it is mined. The difficulty of securing cars has so limited the available supply of coal that the prices have doubled practically all over the country and in some places where summer stocking is not done, there is actual danger of suffering, while everywhere people are having to pay practically a two-fold price for coal.

The freight car problem of the country in a way is similar to the traffic problem on the street cars in the larger cities of the country in that it seems impossible to find a positive solution to the problem. This is because there are periods of heavy traffic and of slow traffic. To provide for all the needs of the feverish periods of heavy traffic would call for an equipment so extensive that in times of dull business the burden of this idle equipment would be a heavy loss.

It does seem, however, that by concentrating upon this problem of freight moving facilities we should be able to get things in better shape and be prepared to handle with more dispatch what might be termed the peak loads of industrial requirements. If we could put a stop to part of the wrangling between railroads and shippers and between railway owners and their employes and turn more co-operative attention to the solving of the problem of transportation we would probably get along better. Another thing, during periods of depression is admittedly a good time to prepare for heavy business, when business was dull and the railroads could have bought material cheaply and built surplus cars for future needs they didn't do it because their profits were small and they couldn't see the need of additional equipment when they were not busy. When they get busy and need the additional equipment, material s high and help is scarce, consequently they are not able then to supply promptly the extra cars and engines needed.

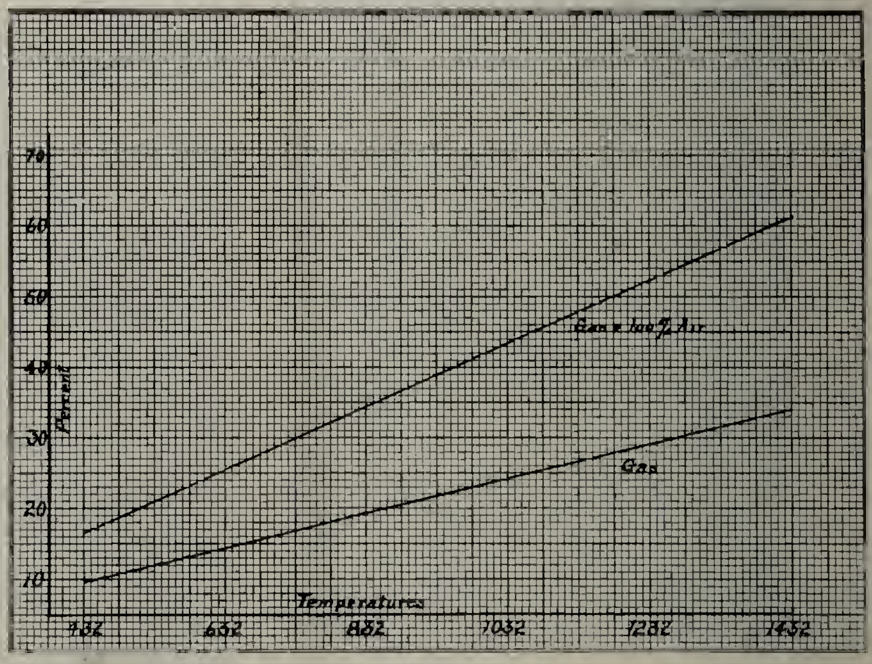


Figure 12.

Sometimes it looks like there is a good deal of the Arkansas traveler logic in railway management, that is the same kind of logic put up by the Arkansas fiddler, who didn't patch his roof when it wasn't raining because it didn't need it, and when it did need it he couldn't patch it because it was raining. A little more foresight and rational figuring on the part of railway management should make for better conditions in the car supply.

WHEN THE JUDGE WAS LOST.

A complicated case was being argued before the court, and the lawyer, a scholarly man, had looked up his authorities and gone back to Julius Caesar. At the end of an hour and a half, in the most intricate part of his plea, he was pained to see what looked like inattention. It was as he had feared. The judge was unable to appreciate the nice points of his argument. "Your honor," he said, "I beg your pardon, but do you follow me?"

"I have so far," answered the judge, shifting wearily about in his chair, "but I'll say frankly that if I thought I could find my way back I'd quit right here."

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

Part XV—Producer Gas—(Continued).

THE OPERATION of a producer to the uninitiated seems a very simple process—dump the coal in from the top, remove the ash from the bottom, and lead the gas to the kiln. It is, however, not so simple. The coal must be fed to keep practically constant the maximum efficiency depth of fuel. This means frequent feeding if the operation is periodic. If the coal is dropped through a circular opening it would pile up in the center of the producer and the blast would work to the sides. See sketch No. 12. Such feeding would involve frequent poking to keep the fuel bed reasonably level.

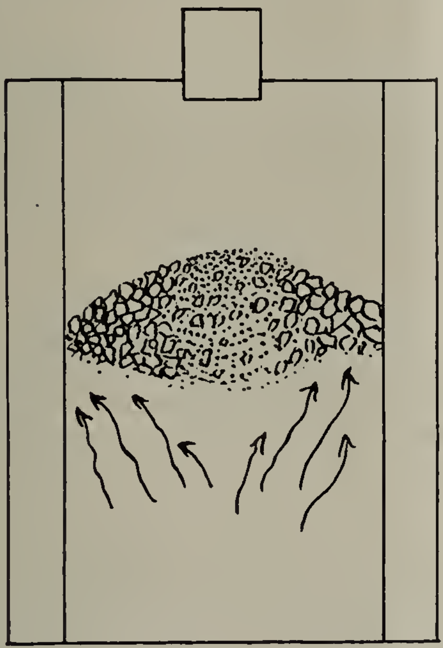


Figure 13.

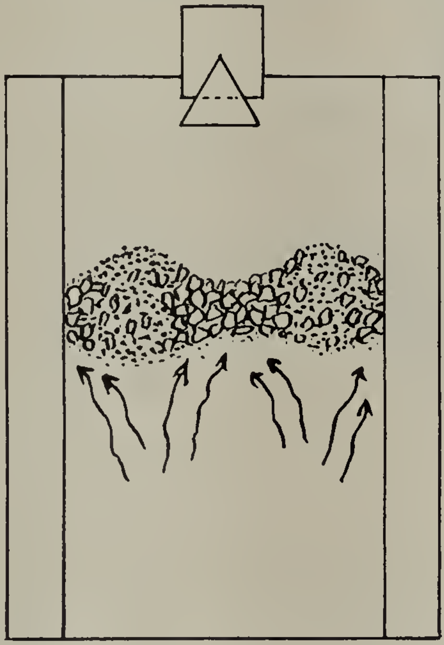


Figure 14.

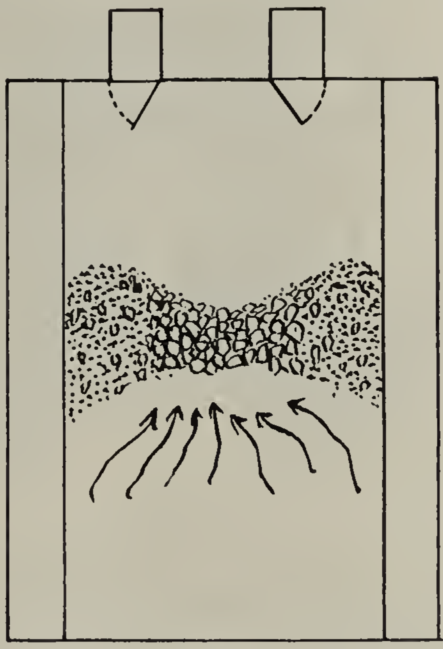


Figure 15.

A bell hopper would give the condition shown in sketch No. 14, or in sketch No. 15, if the hopper were large. The need of a level fuel bed, has been met by several spreading devices. The Bildt feeder distributes the coal spirally from center to circumference, and as the feeder revolves the entire surface is covered. In the Chapman mechanically operated producer the producer shell revolves, but the top and base are stationery. The feed hopper is on one side and its diameter approximates the semi-diameter of the producer. It extends into the producer to the top level of the fuel bed. As the fuel bed settles coal from the hopper fills the space and the lower edge of the hopper spreads it to a level surface. The entire surface of the fuel bed is covered by the revolution of the producer. The upper and lower parts of the producer are separate and both revolve in the same direction, but at different speeds. This gives a twisting motion of the fuel bed upon itself which keeps the fuel bed stirred up and breaks up the ash clinkers. A plow attached to the lower edge of the shell removes the ash. In some producers, mechanical stirrers are used to keep the fuel bed stirred even down into the ash pit. The point we wish to bring out is that satisfactory operation of the producer requires considerable labor to keep the fuel bed in proper condition, to remove and break up the clinkers, and to remove the ash as may be required to maintain the proper depth and to keep it level, and if the fuel is bad, high in ash and sulphurs, it will seriously interfere with the necessary continuous and uniform operations of the producer.

The pressure and air volume is induced by the aspirating effect of the jet of steam which has an intial pressure of sixty pounds to eighty pounds. The volume of air is dependent upon pressure of the steam and surface area of the steam in contact with the air. A small jet from a simple needle valve will not carry with it a sufficient volume of air. The development of the inspirators has been to increase the surface area of the steam jet. As an illustration one type of inspirator has a relatively large annular steam jet and air is introduced outside the jet as well as through the core of the jet, thus, first, largely increasing the diameter and surface area of the jet, and, second, doubling the efficiency by using both outer and inner surfaces. The capacity of a producer depends upon the fuel, and the speed and efficiency of operation. We usually estimate the capacity with an average bituminous coal at ten pounds of coal per square foot of grate area per hour, though the manufacturers of some stationary producers will guarantee twelve pounds and even as high as fifteen, and the mechanical producers can be guaranteed for twenty-five pounds, and have been operated up to thirty pounds.

Grate bars are not used in a number of the successful producers in this country, but instead the ash collects on a solid base or in a pit sealed with water. The air and steam are introduced through a pipe in the ash pit to the center of the base, then a riser with a mushroom head terminating in the upper part of the bed of ashes. The head has air ports to distribute the air and steam radially.

The assumed grate area is the area of the base of the combustion zone. A six foot producer has a grate area of twenty-seven feet; an eight foot producer, fifty feet area; a ten foot producer, seventy-eight feet area.

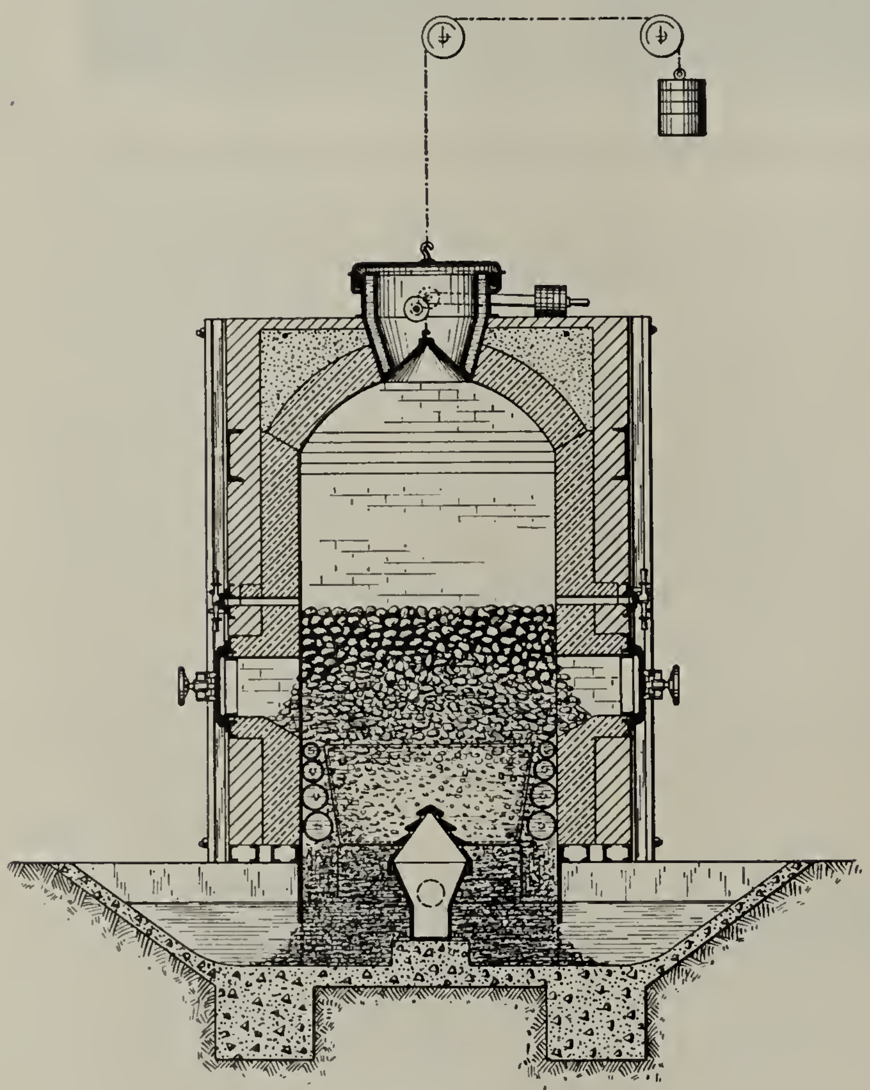


Figure 16.

The smaller size may be safely estimated to have a capacity of 270 pounds of coal per hour, or 3.2 tons per day (24 hours), and the maximum capacity will be 400 pounds per hour, or 4.8 tons per day. The size of a stationary producer is limited by the ability of an operator to keep the fuel bed in proper condition by poking, and nine feet diameter is the present for hand stoking, but unless the fuel is excellent in every respect a smaller size is preferable. The mechanical producers are practical in larger sizes, but we do not know of any exceeding ten feet in internal diameter.

It is not our purpose to present a historical reveiw of the development of the gas producer, nor to describe the numerous producers on the market.

Such data is available in Wyer's "Producer Gas and Gas Producers," in Nagel's "Producer Gas Fired Furnaces," in Damour's "Industrial Furnaces," in Dowson & Larter's "Producer Gas," and in technical journals and trade pamphlets. To take up this interesting subject would only be a compilation and duplication from these various publications, and of greater interest to those designing and building producers than to clayworkers operating them.

The producer illustrated in Fig. 16 and Fig. 17 to show the general outline of a producer, and the several producer zones, is the Richardson producer. It differs from the usual type of producer in that it is rectangular, being five feet wide and ten feet long, and has two feed holes—in other words it is practically two producers in one.

It is hand-fed, hand-stoked, and water sealed. The bosh is backed up by water cooled pipes to cool the ash and prevent excessive clinkering. The air-steam blast head extends the length of the producer, and has escape ports in the mushroom head from end to end of the producer. Back of the producer is built a large chamber in which some of the dust, soot and tar accompanying the gas will collect and which may be easily cleaned. The chamber serves as a gas reservoir in which the gas pressure is equalized and in consequence the puffing effect sometimes noticeable and occasionally troublesome is overcome. Mr. Richardson has in view a simple and inexpensive producer built of bricks and adaptable to the clayworkers needs.

The losses in a producer are:

1. Heat in the ash.
2. Carbon in the ash.
3. Sulphur in the ash.
4. Generation of pressure steam.
5. Evaporation of moisture.
6. Tar and soot.
7. Radiation.
8. Dissociation of steam.
9. Distillation and dissociation of hydro-carbons.
10. Sensible heat in the gas.

Nos. 1 to 7 are absolute losses.

Nos. 8 to 10 are recoverable, in full or in part, in the kiln.

The Ash.

Since the ash is cooled in water in the producer hearth, its temperature will not exceed 212° F., and assuming 62° F. for the atmospheric temperature, the loss in temperature is 150° F. In the Hocking Valley coal there was, including the carbon and sulphur, 10.14 per cent. ash which at .16 specific heat would retain 2.4 B. t. u. per pound of coal fired—a negligible amount.

Carbon in Ash.

The chief loss in the ash is the unburned carbon, and this varies widely. In a monograph issued by the manufacturers of a gas producer, largely used in the ceramic industries, the following statement appears: "With the better grades of fuel probably a loss in the ash from less than 1 to 5 per cent. of the heat value of the fuel will cover the range of overage practice. In the poorer and finely divided coals it may reach a much higher figure." Campbell, "The Open Hearth Process," Trans. A. I. M. E., Col XXII states that the loss in consequence of the carbon in the ash will vary from 5 to 20 per cent of the fuel fired, and in a specific case gives the loss as 5.6 per cent. Bull. No. 50, Eng. Experiment Station University of Illinois, in tests of anthracite and coke in a suction gas producer shows a variation from 1.2 to 12 percent carbon in the ash relative to the weight of the fuel. Nagel, "Producer Gas Fired Furnaces," says, "In the old Siemens producer up to 10 percent of the fuel was found in the ash, later producers showed a loss of 5 percent, while in modern producers the loss is said to be reduced to 1 percent or 1.5 percent." R. D. Wood & Company give the record of a battery of boiler producers in which the carbon in the ash is .5 percent. If we omit the two highest amounts, which are exceptional and average the remaining percentages, we get about 4 percent, which would be 35 percent of the ash, but we will figure on the basis of 25 percent, the same as in the direct coal firing, although 35 percent agrees closely with some recent tests of producer work in a clay working factory. There is good practice and bad practice. The former on the best grades of coal will show the minimum carbon content in the ash, while the latter, on an inferior coal, will reach the maximum limit. The heat value of the carbon in the ash will be 356 B. t. u. per pound of coal (Hocking Valley).

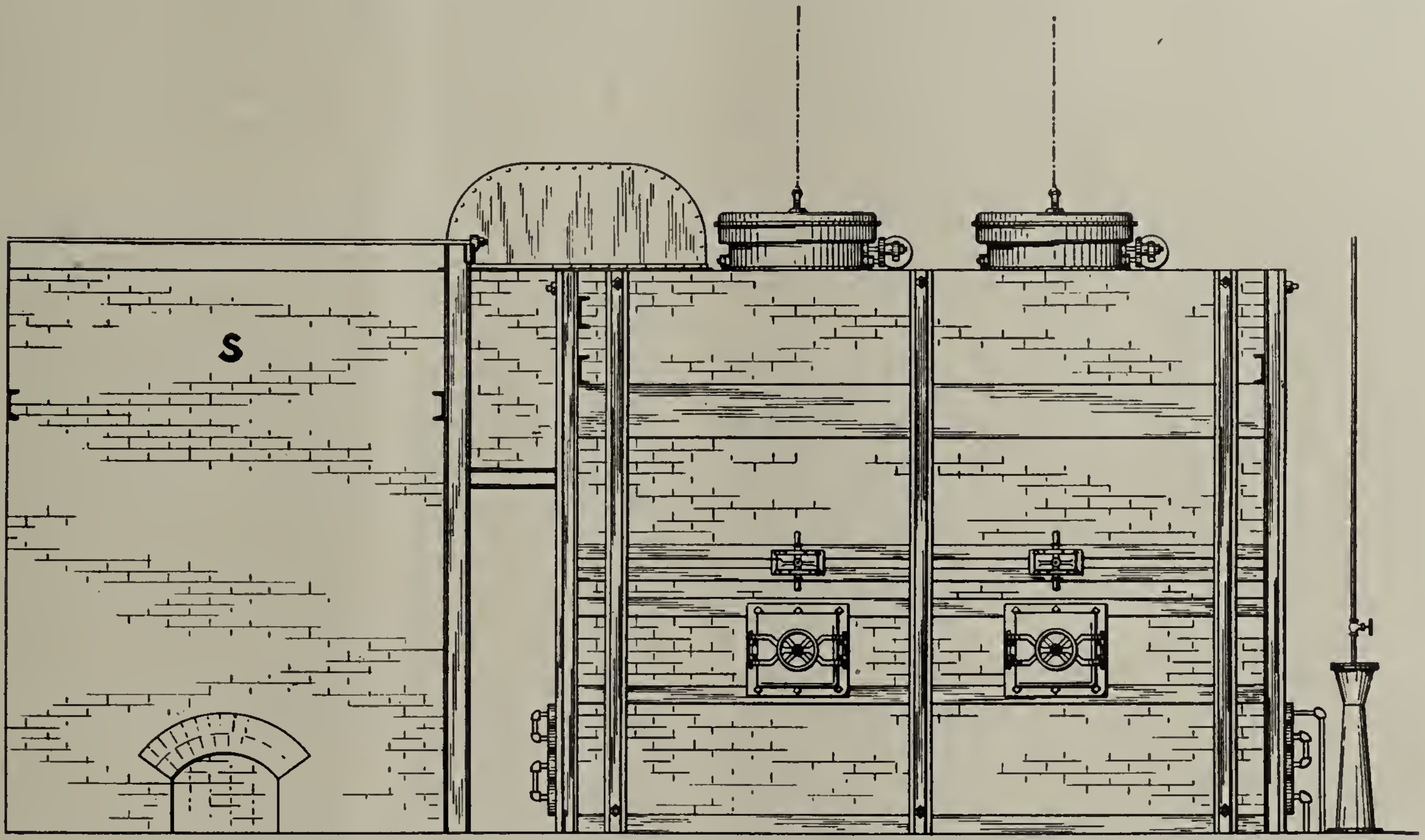
Sulphur in the Ash.

There is no data on the sulphur in the ash and gas. Assuming as we did in open grate firing, that 10 percent of the sulphur in the coal is retained by the ash, we have from the Hocking Valley coal .0033 pound of sulphur per pound of coal, which in combustion would develop 13 B. t. u. A sulphurous coal is not satisfactory in producer work in that it tends to produce a fusible ash and excessive clinkering.

(To Be Continued)

SEEN IN NEW JERSEY.

RUDOLPH KRANZ, formerly selling agent, has purchased the plant of the New Jersey Brick Company, which was damaged in the explosion of the Canadian Car & Foundry Co., at Lyndhurst, and is putting it in shape for active work. The plant has made shale brick heretofore and was fitted for all the year operation. It is understood that the same general methods will be followed by the new owner. Mr. Kranz is located at Paterson, where he has built up a good brick business, and now he hopes to make a fair share at his own plants. He will still retain his accounts since his own plant cannot produce enough to fill his orders.



Burning Clay Ware, Figure 17.

Nathan H. Sloan, of Paterson, has felt the impulse of improving business since the opening of this month. His inquiries the first few days of the month totaled something like 3,000,000 and are still coming. Certain large projects are under consideration for which contractors are making inquiries. He says that the outlook is much better than it was in July and predicts a good business through the fall.

The price of common brick has declined in New Jersey from the high point of $12.00 in the early summer to about $9.00 now, and in some instances $8.50. Many plants are operating to only partial capacity, largely because of the scarcity and cost of labor. Fuel is an item which bothers makers, and in some instances they have reverted to the wood pile as a means for burning, but obviously even that has its limitations when cars have to be found for shipping it to the yard. The result is that in the eastern part of the state yards are not working to anything like capacity, nor will they be likely to do so during the remainder of the season. The price has been high enough thus far to insure a reasonable profit for the output, but now that it is dropping, some may find it necessary to close entirely.

Newark is about the only center which reports good business, but there because of its selection as a site for a shipyard and various other important projects, building hasn't fallen off as it has almost everywhere else. But Newark is an exception this month and its builders are among the more fortunate ones.

In the Paterson district, which includes a considerable circle of suburban communities, all of which have been growing pretty fast these past few years, construction is limited to dwellings this month. A number of large mills and business buildings are in process of erection, but new contracts are by no means numerous, nor important. During the first few days of the month business appeared to pick up somewhat and one brick dealer had inquiries totaling 3,000,000, but that was no more than he should have had and represented some which did not come in July.

Along the Hackensack river some work is in progress and shipping goes on as cars can be obtained. Some are utilizing motor trucks, but since the government began to place rush orders for immense numbers of trucks it is practically impossible to obtain them. Nearby deliveries are managed by team, but teams are not numerous, either, and the work is hampered more or less, like everything else, no matter which way the manufacturer turns, or what he undertakes to modify the restrictions which are based upon the unsettled conditions caused by the war.

Edward M. Rodrock, of the Edward M. Rodrock Company, a leading dealer in brick and fireproofing of Paterson, says that his business has continued good throughout the troublous times through which the country is passing. He reports half as many again cars handled in June, as in June of a year ago, and the proportion of cars handled in July exceeded even June. He says too, that trade is picking up and looks for better business through the remainder of the season. His assortment comprises all varieties of burned clay, and he thinks the outlook for everything in this department is better than it has been in months.

In the Raritan section business is reported fair to good, with most of the plants operating as near capacity as circumstances allow and with sufficient orders on hand to consume practically everything they can make at the ruling prices. Quotations show a little disposition to decline, but in the main business proceeds at about the usual rate. It is true that none of the yards are overcrowded, the general business condition precluding that, but most of them have as much business as they can conveniently handle, which at present is ample. Larger business in some instances would be more or less embarrassing. A. L. B.

BLAZING THE WAY TO BETTER HOMES.

The Unburnable Home is the Best Home and Brick and Tile Are the Logical Materials for Economy and Beauty.

THERE HAS BEEN a "better homes" movement on for some time in the furniture trade, and the matter has been agitated considerably in the furniture trade journals. Meantime, dating back three or four years, The Clay-Worker has been persistently urging a movement under the slogan of "Build With Brick" that should have been more closely linked up with all the propaganda that followed, because it is the building itself which was the basis of the better home, and admittedly brick is the best building material on earth. Under the headline of "Blazing a Commercial Trail to Better Homes," the editor of the Grand Rapids Furniture Record tells an interesting story of how popular education is linked with better merchandising, and all of it is hitched on to the propaganda of better homes and more satisfaction out of life. Under this heading the editor of the Furniture Record says:

"Indianapolis—if zeal and initiative are accepted as the basis of selection—may claim the headquarters of the 'Better Home' campaign, when the national crusade contemplated by the Allied Home Furnishing Industries is fully organized. For, more than seven years the gospel of better homes has been recognized in the Indianapolis public schools; since that time there has been developed a degree of popular interest in the art of home making that distinguishes the city and its people as of peculiar attainment.

"The Record has been privileged to present in its issues of May, 1916, and in June of the current year something of that which has been accomplished in the way of home betterment through the class in Home Planning and Designing of the Heron Art Institute, Manual Training and Technical High Schools of Indianapolis, of which Miss Estelle Peel Izor is the head. Those articles, which were by Miss Izor's authorship concerned the practical demonstrations through which home furnishing problems, financial as well as artistic, have been actually solved by Indianapolis students and housewives; model homes furnished and decorated in every detail by the young people—and many of more than school age—under Miss Izor's tutelage.

"The breadth of the work and its practical application is reflected in the fact that one of the experiments had to do with a home of more or less elaborate appointments; the other with the equipment of a home on an income of $600. Nothing will give a more adequate idea of the economic and commercial importance of that which Indianapolis educators are doing and of the sensible manner in which it is being accomplished. * * *"

Coincident with the arrival of the publication containing this editorial there comes to hand a publication entitled The Farmhouse Improved, the same being a bulletin of the Kansas State Agricultural College, prepared by William Alonzo Etherton, professor of Rural Architecture of the Kansas State Agricultural College, in co-operation with the National Lumber Manufacturers' Association.

Note that last item—"the National Lumber Manufacturers' Association," because it is significant. The publication is one calculated to, and probably will make for improved conditions in rural homes. That much we can all say amen to. The thing that makes the editorial force of The Clay-Worker want to tear out a part of the remaining scant supply of hair is the fact that the entire bulletin of about 90 pages is illustrated throughout with pictures and plans and methods of construction for frame buildings! There is absolutely not a single brick building plan shown. There are brick fireplaces and chimneys, and in one instance there are brick piers and parapet walls for the front porch, but while there is reference to concrete and its uses and stucco, and, of course, a preponderance of attention to lumber, no building with brick is suggested.

There is no thought here of blaming the lumber folks for featuring lumber in a proposition of this kind. It is a splendid example of advertising work, and the thing to blame for the fact that brick and other clay products are not occupying the distinctive place given lumber in this publication is the lethargy of those engaged in the clayworking industry.

Brick manufacturers and other clayworkers know they have the best building material on earth, and they are apparently too much inclined to rest upon this knowledge and not exert themselves to impress the fact itself upon the public at large. There is before the trade today perhaps the greatest opportunity in the history of the industry to boost its business wonderfully, and in so doing to contribute materially to the better homes movement and to the general improvement and upbuilding of the country through the encouragement of ideal homes and home surroundings.

People in various lines of industry and trade are actively blazing the way today for better homes. The furniture people are at it very actively, as has just been shown. Meantime the real estate people in various cities have been, even in the face of war conditions, pushing forward the "Buy a Home First" idea, and everywhere all around us there is a centering of much thought and attention upon the subject of home building and home improvement.

One of the outstanding characteristics of this big country of ours is its homes. The great mass of common people have better homes here than in any other country on earth. That much is admitted. What is even more important is that the home building spirit is stronger here than anywhere else in the world, and that spirit is being awakened to the end that even higher ideals in home building and home surroundings may become the rule instead of the exception.

That this idea is good and needs fostering is so readily evident that no one anywhere has sought in any way to discourage it. It is an idea which has unanimous approval, because it is plainly good, one of the best ideas that could be promoted and kept before the people.

Now, since all this is true, and since the way is being blazed for better homes and better home surroundings, the question which the clay working industry should set itself to thinking actively about, and getting ready to do something about, is what part shall the clayworking industry play in this campaign?

Somehow it seems to us like enough has been said for this time. Think it over, and then write us about it.

BUILD NOW!

Eight Reasons Why You Should Do Your Building, Remodeling and Repairing Right Now

The facts given below should convince you that right now you can get the work done cheaper than will be again possible for many years to come---If Ever

No. 1

There are indications of by far the biggest tourist season Augusta has ever known, and thousands of additional visitors are coming here soon on account of the Camp. A large percentage of these will remain throughout the life of the Camp (from two to five years), or until replaced by others when fresh troops are sent here—if Augusta can accommodate them. If you wait until they get here you'll find the carpenters, painters, plumbers and others too busy to attend to your needs.

No. 2

From now until the end of the war there will be a constantly diminishing supply of skilled workmen in every line of the building trade. The building of the great Camps all over the country is only a starter. The government has appropriated $66,000,000 for the construction of a series of gigantic warehouses. The government's plans call for the building of one million tons of ships during the remaining half of 1917 alone—with probable proportional construction throughout the war. The government is now canvassing the entire United States for carpenters, plumbers, machinists, painters and other workmen to carry on this and other work.

No. 3

With the gigantic demand for workmen in all the building trades there is, and will continue to be during the term of war, a corresponding demand for lumber, brick, tile, metal and composition roofing, cement, plaster, nails, glass, paint, hardware, plumbing supplies, and everything else that enters into building construction. And all orders for materials for government emergency construction will, necessarily, come ahead of orders for materials for ordinary construction.

No. 4

There is no reason why the cost of labor and material should decline for many years after the war is over. The longer the war lasts the more completely devastated will be the warring countries of Europe, and the greater and more lasting will be the demand for our construction materials for the rehabilitation of those countries. And this traffic, added to the re-establishment of normal merchant shipping, will cause a continued enormous demand for shipping and the labor it takes to build it.

No. 5

Rail transportation difficulties which were considered extremely serious before our entry in the war promise to become more and more pronounced with the constant transporting of hundreds of thousands of troops and vast quantities of war supplies throughout the nation. Transportation for war purposes, of course, comes ahead of everything else, and must be carried on without delay. And the construction of additional rolling stock is necessarily hampered by shortage of material and labor.

No. 6

Many kinds of raw materials from which building supplies and fixtures are manufactured are also indispensable to the manufacture of munitions and implements of war, which are right now being made, not only for this government, but also for those of our Allies. The demand for these materials is almost beyond the power of human imagination, and the factories naturally are giving their attention to the war orders first.

No. 7

There is no prospect of lumber ever again being cheaper than it is right now —the demand is increasing, and the supply diminishing. Brick will never be lower in price—scarcity of labor and increased cost of equipment make that certain.

Paint, the principal ingredients of which are lead, zinc and linseed oil, will certainly not be cheaper within the next five years. The government has made immense contracts for lead and zinc, and the flax crop from which linseed oil is made, is estimated by experts at only 50 per cent. normal on account of dry weather.

Glass, on account of scarcity of labor and materials, will cost from 20 per cent. to 50 per cent. more this fall than it does now. Metal and composition roofing, cement, plaster, nails, metal re-inforcing material for concrete, and all other materials, are affected by either demand, labor, or transportation, and in many cases by all three.

No. 8

Therefore, the longer you delay doing the needed repairing and painting, the greater will be your loss from depreciation and the more it will cost you to have it done. And, likewise, the longer you delay building, the more expensive it will be and the poorer investment you will have. Material prices, at present, are not out of reach by any means; labor is available, and there is a big demand for houses of every description. Therefore, NOW IS THE TIME TO BUILD!

Build Now Publicity Committee

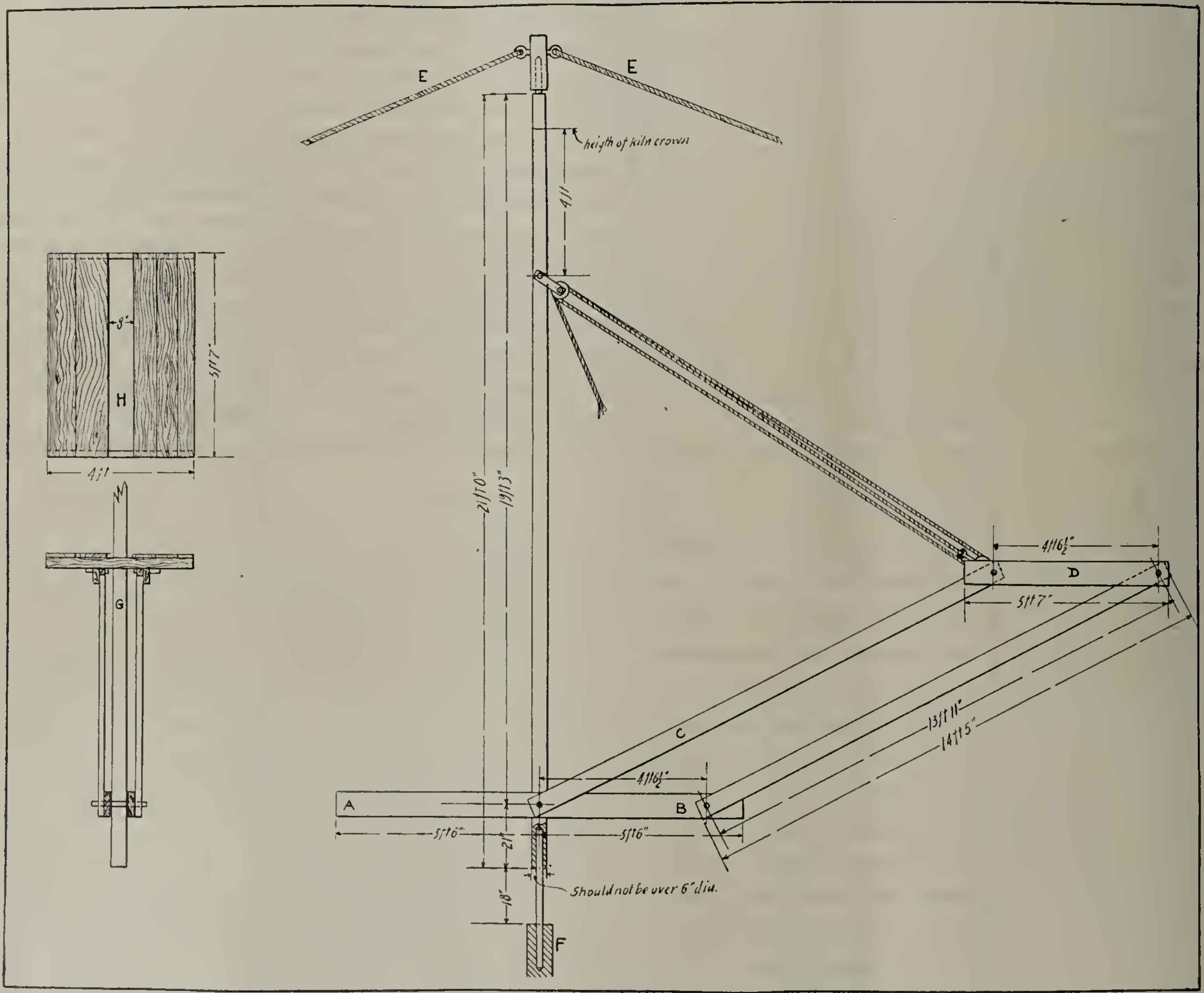
City of Augusta, Georgia

Miniature of Full Page Advertisement Which Appeared in the August 5 Edition of The Augusta Chronicle.

Kiln Department

ECONOMY IN KILN CROWN BUILDING.

A Clever Apparatus Used By a Tile Manufacturer Which Makes a Considerable Saving in Time, Labor and Expense.



Portable Rig for Building Kiln Crowns.

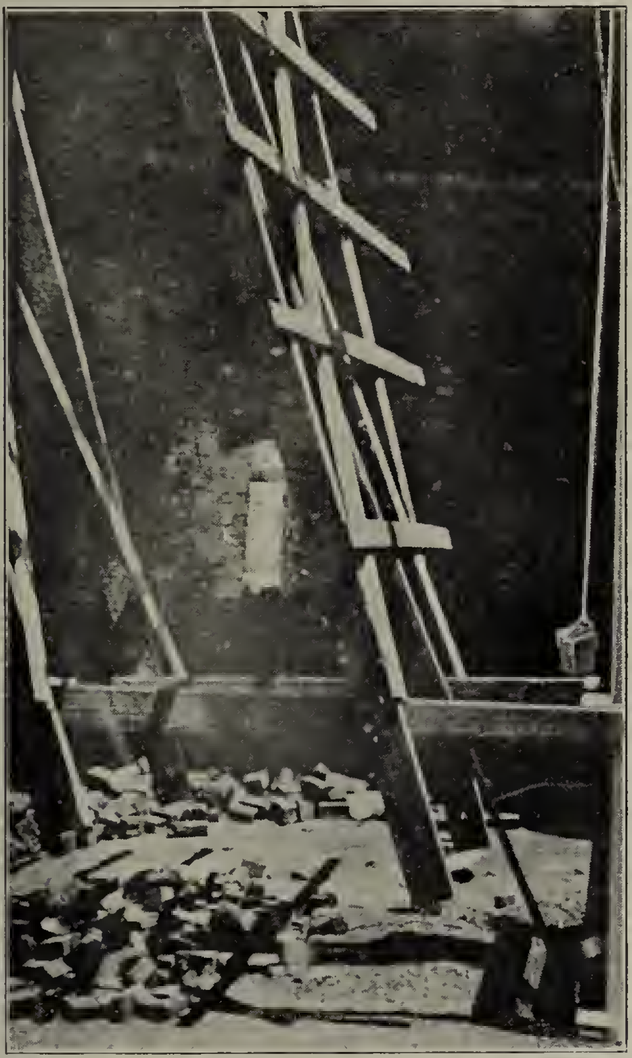
IN THIS DAY AND AGE of high cost of living and high cost of everything entering into the manufacture of any commodity, it becomes each of us to count the cost and to reduce same to the lowest possible point, in keeping with efficiency and safety, in the manufacture and quality in the finished article.

In every line of endeavor cost is mounting higher, and especially is this true in the manufacture of clay products. With increased cost of coal, labor and everything entering into the general overhead, increased prices must be asked, or more economical means formed in the production. Both are important items.

We illustrate an apparatus which is used by a Hoosier tile manufacturer which seems to have many advantages over the usual means of building kiln crowns. Usually in building a kiln crown, the manufacturer must use several thousand feet of lumber to build scaffolding, and much time and trouble, to say nothing of the cost. This apparatus is permanent, does away with scaffolding, gives more room in the kiln for the workmen, and is satisfactory in most every way. The cost of this apparatus, which is good for a lifetime, is $15.00, as against $200 for scaffolding. Another important feature, also, is in the elimination of trouble with the use of the radius pole. While unique, it is simple in construction and fills a long-felt want. As will be seen by the illustration, it is on the order of an old-fashioned boom derrick, except that it has four booms instead of one, in order to maintain a platform on which a man can work. The apparatus consists of a center pole, tower, platform and ballast floor. The platform can be elevated or lowered to any point desired, and not only can it be moved up or down, but can be moved at will around the kiln wall.

The center pole is 6 inches in diameter and is held in place at the top by means of wire cables, which are attached to permanent stakes outside the kiln. This center pole can be easily turned, the upper and lower ends being loose pinned into sockets. The bottom of the center pole stands in a large wooden block placed in the exact center of the kiln floor. The center pole carries the weight of the entire apparatus. Bolted to either side of the center pole, 3 feet from the bottom, are two 3x8 timbers 3 feet long. To the ends of these pieces and spiked, 2x8 timbers 13 feet long. See A B in accompanying sketch. Across the top of these timbers, at the end of A, is a platform used for loading ballast to take care of the weight of the derrick arrangement on the end, together with the weight of the workmen.

Four strong beams (C) loose bolted to section A B and the platform (D) swing to the platform to the height desired, a block and tackle arrangement being used in this connection.



One End of Base—Notice Loose Bolted Supports for Working Platform.

The platform has a slot in it (H) for the radius pole (G), which is attached to the bottom of the center pole and can be pulled over to the crown as desired, a weight on a rope pulling it back to a place out of the way while the workmen are laying the brick.

It is readily seen that this apparatus can be taken apart and stored away for future use, and there is a permanent investment which cost but $15.00, while the scaffolding itself in the usual kiln crown building would cost something like $200. Not only is this a money saving device in the cost of the material, but as well in the time and labor saved.

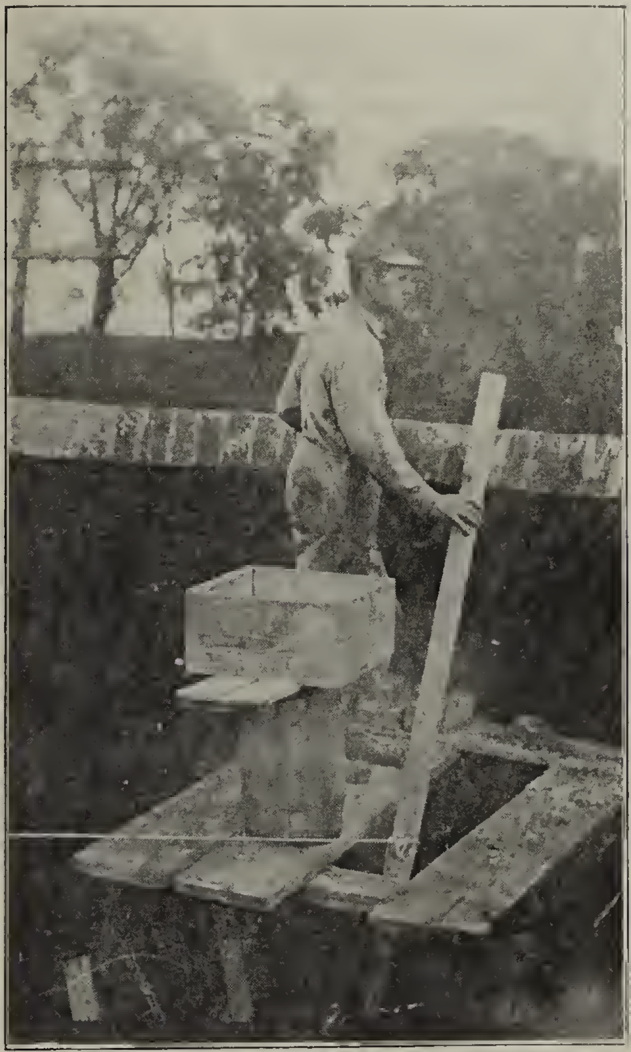
This apparatus, which is being used by Mr. George M. Fries, of the A. Fries & Son Co., of Connersville, Ind., is his own idea, and he is glad to pass it along for the benefit of other clayworkers.

If any other Clay-Worker readers have money-saving devices on their plants which are not generally used on other yards, they can be of great service to the entire clayworking trade by telling others about it through the columns of The Clay-Worker.

GOVERNMENT BEGINS ISSUE OF WEEKLY COAL REPORT.

WEEKLY STATISTICS showing what the soft-coal miners of the country are doing, and why they are not doing more, are now being collected by the United States Geological Survey under Secretary of the Interior Lane. In these strenuous times it is essential that the Government, particularly the committee on coal production, as well as the general coal-consuming public, be kept informed of exactly what the mines are bringing forth and, what is more important, what is hindering greater output of the basic product, coal.

In submitting this first weekly report to Secretary Lane and the coal committee, Director Smith, of the Geological Survey, states that what has been accomplished in the six weeks since this statistical report was begun, is largely due to the patriotic and prompt co-operation offered by the coal-trade associations' secretaries and the operators, whether members or non-members of associations. These figures from all sources are reduced to a comparable basis by a force of statisticians under C. E. Lesher, of the Geological Survey, with the immediate purpose of showing what factors in each district are limiting production and shipments. With this information before it, the committee on coal production is able to concentrate its efforts where the greatest stringency lies—whether, as in most localities, the trouble is lack of cars, or whether it is labor shortage. The operators realizing that their interest lies in having this information promptly available, their support of this work, although it involves additional labor on their part, has been prompt and hearty. The first figures available give comparison of the first week of July with two weeks of June and are those furnished by the already organized trade organizations, which represent about 25 per cent. of the production of the country. Some of the important producing districts, particularly Alabama, West Virginia, parts of Pennsylvania, Ohio, and the territory from Texas to Iowa,



Working Platform Showing Use of Radius Pole.

figures from which are not shown in this first statement, are being rapidly organized for this purpose and have already furnished partial information. The weekly reports that will follow hereafter will include successively greater tonnage and be more representative of the total.

The districts covered by this statement are distributed over a large producing area and are indicative of what is happening in the coal-mining industry. A more general idea of the total production, but without indication of the causes of the loss of working time at the mines, will be found in the monthly bulletins issued by the Geological Survey, which are based on the daily, weekly and monthly reports furnished by railroads originating more than 85 per cent. of the coal production of the United States, which bulletins are in no way supplanted by these weekly studies of the particular causes hampering greater output at the mines.

PACIFIC COAST NEWS.

DURING THE MONTH of July, private construction in the city and county of San Francisco reached a total of $1,625,440, and represents the largest amount expended in any one month of 1917, with the exception of January, when the figures totaled $1,779,774. Considering that July is a mid-summer month, when building construction and real estate transactions are generally at low ebb, the total for July can only be regarded as a most satisfactory one. Added to the totals for private construction for July is $131,988 of Government construction, $63,407 of state work and $49,122 expended by the city, making a grand total of $1,869,959. Furthermore, in connection with the total for Government construction given above, contracts amounting to $2,316,218, awarded during the past month, were undoubtedly let to San Francisco firms. This is gratifying to all branches of the building supply industry.

The four-story pottery plant of N. Clark & Sons on the western waterfront of Alameda, Cal., was practically destroyed by fire on the morning of July 28. The flames were discovered by F. T. Wilbur, foreman of the sewer pipe department, who immediately turned off the feed valve from the oil supply tank and sent the alarm through the building, but before the fire could be brought under control, upwards of $200,000 worth of property had been destroyed. The damage is only partially covered by insurance. The plant will be rebuilt immediately along similar lines to the old factory, but it will be several months before the company can fill orders for sewer pipe. The wing containing the terra cotta department, the frame office and the large oil tank were saved, however, and the manufacture of terra cotta products will be continued without interruption. Many of the workmen thrown out of employment by the fire have been retained to clear the site and assist in the re-construction of the plant, so they will not loose any time.

The Clark fire following so soon after the destruction of the Steiger Terra Cotta and Pottery Works in South San Francisco cripples the industry in the Bay district very seriously, but as both plants are to be rebuilt at once, normal production will probably be resumed again by the end of the year. W. E. Dennison, president of the Steiger interests, is back from the East, having arranged certain details in connection with the reconstruction of his company's factory. A. V. Clark expects to go East shortly on a similar mission.

The Federal Construction Company has been awarded the contract for the improvement of Arkansas street, San Francisco, between Eighteenth and Nineteenth streets, the work to include a 14-foot central strip of vitrified brick pavement. A contract has been awarded to Flinn & Treacy for the paving of Kirkwood avenue, between Mendell street and Railroad avenue, including a 14-foot strip of vitrified brick.

The Western Magnesite Association has been organized with a view to working for a protective tariff on magnesite for the preservation of the industry in California after the close of the war. Several firms were represented at the meeting held in San Francisco when the organization was perfected. The following officers were elected: President, Robert D. Adams of the Northwest Magnesite Company; Vice Presidents, Frank Sweasey of the White Rock Mining Company, and George White of the Tulare Mining Company; Secretary, A. N. Sears of the Pacific Magnesite Company.

The Sacramento Clay Products plant, formerly operated at Ben Ali, near Sacramento, Cal., in the manufacture of brick and clay products for building and other purposes, will be revived and the industry again brought to a point of production through a new corporation known as the Cannon-Phillips Company. This concern, having headquarters in Sacramento, has been granted permission by the State Commissioner of Corporations to issue 997 shares of its stock to D. A. Cannon, Claire L. Cannon and J. B. Phillips in exchange for the property of the old company.

The Needles Brick and Tile Company has placed its plant in operation about three miles west of Needles, Cal., which has a capacity of 20,000 bricks a day. Messrs. Beimer and Funke, have secured the services of Wilbur Gamble as foreman of the plant. He has had many years' experience in the brick business. A. Beimer, senior member of the firm, is at present in San Bernardino, recuperating from serious burns received at the plant several weeks ago. He is expected home in another week or two, however.

The Valley Magnesite Company has been incorporated at Spokane, Wash.

New kilns are being erected at the Decoto, Cal., plant of the California Brick Company, which will greatly increase the present output of 50,000 bricks a day.

Edward Shedd, recently elected a director and secretary of the Unit Brick and Tile Company of Santa Barbara, Cal., has gone East to investigate new methods of manufacture with a view to inaugurating important changes and extensions at his company's plant.

Articles of incorporation have been filed in San Francisco for the Terra Cotta Products Company by W. Williams, and J. R. Johnson and A. S. Cohn of that city and J. W. and T. G. Mapel of Emmaton, Cal. The company has a capitalization of $150,000.

Charles F. Rice is preparing to re-open the brick plant, formerly operated by Julian Carey in Richmond, an industrial suburb on the east side of San Francisco Bay. He is installing new machinery and expects to begin operations before the end of August.

At a special election held in Modesto, Cal., the proposition for issuing bonds in the sum of $30,000 to build a storm sewer was defeated, while another proposition for $15,000 for the extension of the sanitary sewer system carried.

The McNear Brick Agency of San Francisco is to furnish the brick for the first unit of extensions to the factory of the California-Hawaiian Sugar Company at Crockett in Conta Costa County, which when completed will represent an expenditure of about $500,000. According to W. W. Dennis of the McNear agency, the order amounts to about 3,000,000 brick. Work is to begin at once and the building will be ready for brick by the end of August.

The city of Fresno, Cal., has let the contract for a sewer system, covering six miles of streets, to Thompson Brothers for $28,000.

LeRoy A. Taylor of Cloverdale, Cal., is making preparations to place some fire-brick clay on the market.

All bids received some time ago for the administration building of the County Hospital group at Sacramento, Cal., have been rejected and the building is to be constructed in units. Construction will be of brick, concrete and hollow tile.

San Francisco, Cal., August 6. SUNSET.

THE MAGNESITE BRICK PLANT OF THE AMERICAN REFRACTORIES COMPANY, CURTIS BAY, NEAR BALTIMORE, MD.

AWAY FROM THE HEAT and the dust of the city streets, over the beautiful bridge recently erected across the Petapsco River, one's brain relaxes and the cobwebs are all swept away by the restful view and the various boats dotting the water's surface.

Speeding along by trolley, we alighted, cool and refreshed to behold the plant recently constructed for the manufacture of magnesite brick. The location is ideal and also necessary for the transaction of business and selected because of its proximity to the Atlantic Coast Harbor, since all raw product in normal times comes from Austria. Needless to say we are not importing any raw materials from that country now, instead much of the material for magensite brick is being transported from California.

The plant in question occupies fifteen acres of ground, stands cool, clean, erect before one, like a well trained soldier at "attention." Construction was started March 1, 1917, and in seventy-seven working days time, was ready for operation. This is almost a record breaker. The structure is entirely of brick, concrete and steel, of modern factory type and contains twenty thousand square feet of glass. The structure comprises the following buildings: A raw material storage building, 200 feet by 60 feet, with a switch running into same, a molding building, 200 feet by 20 feet, a dryer building, containing mechanical dryer, a shops building, containing complete machine shop, blacksmithing, carpenter shop and store room, a stock shed and two boiler houses, containing a 300 h. p. boiler each, and eight, 32 round down draft kilns. The office and garage complete the structures of the plant.

The company made its first brick in June and ever since has been presistently and thoroughly training green hands for the work. None of the workmen, some black and some white, had ever done any work in this line, so one can readily realize the gigantic job that faced Mr. A. F. Greaves Walker, whose capability shows itself in face, feature and manner, as he sits thoughtfully before you, giving such information as he deems prudent and sufficient.

The capacity of this plant is 25,000 nine-inch magnesite brick and the work continues the year round. The only brick manufactured is magnesite brick, with the exception of a few chrome brick.

The methods of manufacture are much the same as those in vogue in press brick plants. Particularly is this true of the presses on which the brick are made. They have two special four-mold Boyd dry presses, furnished by the Chisholm, Boyd & White Company, Chicago, with which they are much pleased. From the presses the brick are placed on cars, taken through dryers and on to the kilns in the ordinary way.

The plant employs from seventy-five to one hundred men. While at a glance this seems few for such a large sized plant, yet everything is so automatically handled that a few proficient men take the place of many ordinary workmen.

The coal is handled in coal pockets and the entire plant is electrically equipped. The men are treated with far more than usual consideration, all provided with private lockers, baths and showers and drinking fountains. Let us hope that these men fully appreciate all these conveniences and comforts, let us go further and say luxuries. Their wages are 25 per cent. more than the usual wage of the brick plants, and all appear to be working with the harmony to be expected with such a virile man as Mr. Walker for manager. The offices are cool and spotless, roomy enough for gymnasiums, with the high polish on desk tops; etc., that belongs to the elect. We wish Mr. Greaves Walker all the success that efficiency claims and in doing that, we are also wishing everything worth while to the American Refractories Company.

M. E. T.

General View of the New Magnesite Brick Plant of the American Refractories Company.

INVENT CLAY SUBSTITUTE.

A substitute for fire clay, it is claimed, has been patented in France, which employs blue pottery clay, one part; common shale, one-half part; coal ashes, one-quarter part fine sand, one-quarter part, and glass, one-eighth part. These ingredients are well ground together and are then mixed with water to the required consistency.

BUSINESS AS USUAL AT PLYMOUTH.

R. L. Hoffman, representing the J. D. Fate Co., Plymouth, Ohio, called at The Clay Worker sanctuary recently, and reported that business was good, notwithstanding the excitement due to preparations for war. The demand for Fate machinery is up to the average of good years, and their gasoline locomotive for industrial plants keeps that part of the factory working full time.

THE ECONOMIC VALUE OF OUR IMPROVED ROADS.

Some Interesting Facts and Figures on Indiana's Highways, by Ephraim Gregory, in The Indiana Farmer.

INDIANA, our own beloved state, and one of the best states in the Union, is getting a reputation far and wide on account of our excellent system of good roads. Our state is one of the leaders in agriculture, stock raising, mining, manufacturing, and in other like industries. It is one of the pioneers in the great work of reform and advancement. We are fast forging to the front in many lines. But I doubt if any other work shows more improvement than our good roads system. Almost every day I hear flattering comments upon the good roads of Indiana from people of other states.

We have quite an extensive system of improved roads. You might travel by automobile all over the State, visit all of the larger cities, even in mid-winter, and never once leave the improved roads. Something to be proud of I should say. And yet there are some communities that have almost no improved roads. Strange, isn't it, when under the laws we now have any community may have improved roads if only the majority of the people will try to get them? And that's just it. There are still some people right here in good old Indiana who fight against road building, usually on account of the taxes. But we pay more taxes for the right to travel over unimproved roads. Maybe not as taxes, but we pay the toll all the same.

One of my neighbors, in trying to describe to me the awful condition of the roads here before they were improved, said it used to take him two days to deliver a load of wheat to the station, and that he could haul only 20 bushels at a load. He gave me these figures:

2 days' wages for man and team	$4.00
1 night's lodging in town	1.00
	$5.00

Five dollars for delivering 20 bushels of wheat, or $25 per 100 bushels, or 25 cents a bushel. And now that we have good hard roads to haul over, this same man can deliver two loads a day of 50 bushels each:

1 day's wages for man and team	$3.00
1 day's' board at home	0.00
	$3.00

Three dollars, now, for delivering 100 bushels of wheat. A saving of $22 a day while hauling wheat. Say he raised 600 bushels, his saving on this job alone would be $132. Certainly he paid a neat little toll for hauling over poor roads. And every other man is paying for it too, maybe not so much as in the case just cited, but a great deal more than for improved roads.

And we pay in other ways. Bad roads are very hard on horses and vehicles. Horses wear out quicker and vehicles break down and go to wreck in a short time.

I am on the road a great deal—all sorts of roads, good, bad, indifferent and intolerable, almost. All breakage of harness and wagon happens on the unimproved roads. I feel sure that my expenses due to breakage while on these bad roads would be sufficient to pay my share of improved road taxes, to say nothing about the saving of time, horse flesh and such things.

Good, improved roads make land more valuable. Anyone will pay more for land located on an improved road. Of course, this doesn't help unless you sell, but no one knows when he might want to sell. You may be expecting to live and die on the place you now own, but there's no telling what conditions may arise to necessitate a change. And wouldn't it be a great satisfaction to know that you could get a good price for your land if you should decide to sell.

I know one man who makes a business of buying farms on unimproved roads near an improved road. Then he hustles like sixty until he gets an improved road extended so as to reach this place so he can resell at a good profit. This and other similar cases are what prompted me to say that any community could have improved roads if only the people would work to get them.

Good roads improve the social phase of life. Schools and churches flourish where there are roads that may be traveled with ease at all seasons of the year. Farmers have more leisure time in winter than in summer. If they have only mud roads they must spend most of this time housed up rather than to get out and be filled with that wholesome, uplifting influence which comes with social intercourse, mingling one with another. And the young folks. How good it is for them to get out and get acquainted with the world as soon as possible. They should not be denied some pleasures. They should be encouraged to attend school regularly as well as church. And there's nothing wrong in going, once in a while, to see a good, clean show. In fact, such things are needed as much as the schooling—it's a part of the education. Young people should be allowed to visit, to have parties and all sorts of social meetings. They should be allowed to get out and go places. And they ought to have a good way to go as well as good roads to travel over.

This Sort of Road May be Impassable at the Very Time the Market is Offering Highest Prices for Farm Products.

When Daniel Boone's children went anywhere their father had to accompany them with his gun for protection, and they all waded the mud, when it was muddy, wherever they went. But it's a long time since Daniel Boone went from place to place in Indiana.

But I started out to say something about the value of improved roads. I give up. It can't be told in figures. For figures won't lie, and if I told the truth there wouldn"t be room for all of them.

TWENTY-SEVEN MILES OF BRICK PAVEMENT IN AN OHIO COUNTY, PART OF LINCOLN HIGHWAY.

COLUMBIANA COUNTY, OHIO, claims credit for the longest continuous stretch of permanent improvement on the Lincoln Highway to be completed for the current year. Twenty-seven miles of this famous road across the country are being surfaced with brick and concrete at a total cost of one-half million dollars in round figures.

The completion of this work will forever eliminate one of the worst stretches of Lincoln Highway in the Buckeye State. The road in Columbiana County, which adjoins the Pennsylvania-Ohio line, has long been considered a black spot in the otherwise acceptable condition of the road in Ohio. Efforts tending toward the elimination of this condition have been carried on by the Lincoln Highway Association practically ever since the original routing of the highway through the state.

A persistent and long drawn out campaign for the improvement of this road has been carried on in Columbiana County by Consuls Frank W. Swaney, R. E. Spencer and Clark B. Firestone, Consuls Swaney and Firestone having been on the firing line since the start. They succeeded in securing the interest and co operation of the Columbiana County Commissioners and the East Liverpool Chamber of Commerce and Automobile Club, and with this aid the co-operation of the State Highway Commission. Results were brought to a climax in 1916 with the passage of a million dollar bond issue of which practically one-half has been made available for Lincoln Highway improvement. The City of East Liverpool has done its share by making provision for improvement within the corporate limits, and the improvement as a whole will extend from the Ohio-Pennsylvania state line through the rural communities and the City of East Liverpool for a total distance of twenty-seven miles.

A Leading Road to Market That Can be Depended on at Any Season of the Year.

Although other improvements are being made in each of the states traversed by the Lincoln Highway on the route from coast to coast, the work in Columbiana County surpasses all other endeavors in the extent of practical permanent construction.

A MISLEADING NEWS ITEM.

SOMETIME SINCE an item went the rounds of the daily press to the effect that the great Westinghouse Electric Company at East Pittsburgh, Pa., had under way a secret process for the manufacture of explosives, and for the purpose of turning out same in large quantities wanted to employ one thousand men and women for a period of ten months, during which time they would be interned, as it were, being kept away from the public and not be allowed to communicate with their families, etc., and at the expiration of their term of employment each employe was to receive $4,000. Having received a number of inquiries regarding the truth of the statement, we wrote the publicity department, and have the following reply:

"Dear Mr. Randall:

"Referring to your letter of the 27th inst., the report spread through the Associated Press that our company intended to employ one thousand people for a period of ten months, these people to be interned, has no foundation what ever and has caused our company a great amount of trouble. There is no such proposition. It may interest you to know that we have received 29,000 applications based on this false report.

"Yours very truly,
"L. AMELUNG,
"Westinghouse Department of Publicity."

Assuming that each applicant wrote under two cent postage, and the reply was made in the same way, this seemingly harmless little news item caused a waste in cold cash of over $1,000, and this, too, at a time when every one is preaching economy.

THE HALT AND THE LAME.

With a commendable spirit of forethought George Pope, president of the National Manufacturers Association, has issued a circular letter to manufacturers throughout the country inviting their attention to a condition which may confront us at an early date as a result of casualties in the war. There may be many of our fellow citizens return crippled and his suggestion is that all manufacturers give thought to the subject of furnishing employment for them in the years to come.

We do not believe that any special urging will be necessary in connection with this idea for every employer of help in the country will be glad to do his bit, and the main problem is simply that of making the way clear and of setting about it systematically so that there may be the least practical confusion and suffering.

There is perhaps a matter for thoughtful attention in this connection in some of our state laws in regard to the employment of the halt and the lame. In some states brickmakers and building contractors have heretofore been practically prohibited from giving employment to cripples because of drastic laws in case of injury. Some of the laws class cripples with children under age and the entire burden of responsibility for the well being is placed upon the employer, who often through striving to do a deed of kindness has brought on to himself a heavy burden for damages. It may be well for those interested in promoting this matter to carefully scrutinizing existing state laws pertaining to the employment of cripples, and where they need modifying have these modifications made so as to pave the way to a practical carrying out of the plans proposed for making a place for those partly disabled in the war.

There is no such thing as business as usual under unusual conditions. There is always a chance, however, to make business better and sounder, and that is the chance we need to take right now.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Of Interest to Draftsman.

I think your readers will be interested to know that India ink can be completely cleaned from tracing cloth. It is claimed that it leaves no trace of the ink and does not injure the tracing cloth. This article is being manufactured and sold under the trade name "Rasindia" by E. H. Anderson at 272 East One Hundred and Ninety-nineth street, New York City. A three-ounce bottle, $1.00, and is guaranteed to do the work.

Very truly yours,
W. L. FETHERSTON.

Laclede-Christy Takes Over Large Rochester Plant.

Editor of The Clay-Worker:

We have recently acquired the long-established plant and good will of the Beaver Valley Pot Company, of Rochester, Pa., celebrated for the manufacture of closed and open pots of acknowledged quality.

We shall operate this department hereafter as the Laclede-Christy Company of Pennsylvania, Rochester, Pa. We expect to continue the manufacture of pots from the same high-grade materials—with a consistent effort to improve the product.

Our confidence in the possibility of improvement is warranted by the amply scientific resources of our research department. The L-C laboratory is staffed with skilled ceramists to whom problems are a pleasure.

We trust this announcement will have consideration among our friends in the glass industry. Our St. Louis plant, established sixty-nine years ago, is known nationally for a worthy output of tank blocks, bottom blocks, checkers and bonding clay. We intend that L-C "Beaver Valley" pots shall enjoy an equal reputation. All inquiries will have immediate attention. Advice of any special requirements will be welcome. L-C service is and shall be satisfactory service. All inquiries and orders should be sent direct to Laclede-Christy Company, Rochester, Pa.

Very truly yours,
LACLEDE-CHRISTY CLAY PRODUCTS CO.
J. H. McKelvey,
St. Louis, Mo. Manager Glass Industry Dept.

Like Old Friends, Brick Roads Are Best.

To the Sanctum of The Clay-Worker.

Dear Sanctum:

Having bidden farewell to the editor in chief last week at the gate of the Indiana Hospital for Insane, and not knowing at this time whether he is in room 16, ward 4, of said institution or in the dear old sanctum of the best Clay Journal on earth, I have concluded to send my epistle to the latter place, knowing full well that if it does not fall into the editors hand, that it will reach either the secretary or the good looking young lady that so kindly refreshed the old man with the ice cold glass of water.

Oh that Sanctum of The Clay-Worker, how I would like to spend another happy hour talking over again the memories of the past, in which I was trying to make others believe that I was a real simon-pure brickmaker.

I cannot mention names, but I want to assure you dear reader that the editor, and his secretary, Miss Wallace, whom you all know so well, and I had a real feast of good things while in a kindly spirit we discussed your virtues, and the live part which you have taken in developing one of the greatest industries of the age. You have, and are doing your part nobly, some of you will, I am sure, shoulder again the musket in defense of our threatened country, but if you don't want to go, you ought to be exempt on account of the importance of your calling.

But you will ask what is all this about, I will tell you that last week I dropped into Indianapolis while out on an automobile tour, which had extended as far East as West Virginia, while in Indianapolis I wanted to see two sights in particular, to-wit: Randall and the Soldiers and Sailors Monument, I saw them both, but only one of them recognized me.

I had a splendid time doing the city and trying to keep the city from doing me. Indianapolis is a fine city, with her broad streets, beautiful stores, and palatial homes, and the Claypool Hotel is not to be sneezed at, it is a first class hotel in every particular.

Mr. Randall, his daughter and Miss Wallace became our chaperones, and we truly done Indianapolis up in good shape, we wound up sight seeing near the insane asylum, where we each supposed that we had been doing the rational thing, but when Randall got home and wrote up that very complimentary notice of myself, and published it in The Clay-Work, I very naturally thought he was a little bit off.

In closing this epistle I feel that I must mention a circumstance in connection with our trip. Somewhere between Cincinnati and Indianapolis the support which carried our extra tire, rim, license number and rear light was broken, so that when we reached Indianapolis we were minus all of these things with no clue as to where we parted.

A few days after our return to Springfield I received a postal card from Rushville, Ind., stating that the author had found the above equipments, and having ascertained my name through the Illinois Automobile Department, he was ready to express them to the owner. "He was a real gentleman from Indiana."

Never again shall I speak lightly of the Hoosier. Now that I am out of the paving brick business, and have no pecuniary interest whatever in the manufacture of paving brick, I want to bear my unqualified testimony that in my journey through Illinois, Indiana, Ohio, Kentucky and West Virginia, the best roads that we found were made of brick.

Yours truly,
Springfield, Ill. A. L. CONVERSE.

The Burning Question—Rectangular Versus Round Kilns—Economy of Construction, Etc.

Editor The Clay-Worker:

In my travels and observations, I have noted what seems to me a combination of lavish expenditure and false economy in kiln construction and operation. I have often wondered why the circular type of kiln is used so extensively, especially so where a large capacity is desired, for in my opinion, the larger the circular kiln the less desirable they are. For example take a thirty-five foot circular kiln, and they are quite common in this country, the heat has seventeen feet six inches to travel to reach the center, compared with the fifteen foot wide rectangular type. The latter is the extreme width for that sort of a kiln in my opinion. In this type of kiln heat will reach the center in less than half the time and distance, as in the circular kiln, and the advantages are obvious. There is a saving in time, and more uniformity in the burn. The rectangular kiln is much simpler and easier to set, with little or no liability to roll, a frequent occurrence in circular types, particularly in the large diameter kiln. Of course, rolling may be due in part to careless setting.

The setting of a kiln is far more important than it is generally considered. Men of experience and good common sense should have this work in hand. If Tom, Dick and Harry is permitted to put the brick in the kiln, it is not reasonable to expect good results in burning.

In the matter of construction, many make the mistake of using poor materials and inferior workmanship. I have seen many delapidated kilns that have been in use but a comparatively short time. If they had been built right, and of good material in the first place they would have stood up under ordinary usage for a long period. I helped build kilns thirty-five years ago that are still in use and in good condition. They have averaged thirty-five burns per year, notwithstanding the fact that the temperature reached 2500 degrees F. burning high grade fire brick, etc. Long years ago, I was convinced that it does not pay to employ "jerry work" in the construction of kilns. Proper setting and burning is more important than a knowledge of chemistry to the burner, from a practical viewpoint. I maintain that the best mode of setting and burning cannot be learned from reading or laboratory studies. My father, grandfather and great grandfather were burners of repute in their day and age. I am quite sure that they knew nothing about the carbon contents or soluble salts or alkalies in the clays. But I know that they left a record for successful burning that is unbeaten today. I intend no reflections on chemistry or technical knowledge, but I do insist that practical horse sense is essential to success.

Coming back to construction: The inside of the kiln should be cased with good high grade fire brick, as should the fire boxes. The arch brick should be made to the radius of the opening, which should not be more than eighteen inches, line all headers with brick six and one-half, or brick and one-quarter wide for joint breakers at joints, in alternate courses. This will save a mason's time in breaking and cutting, and he will do better work. All other walls to be of good, hard, wire-cut, common brick, laid in good mortar, with not over one-quarter inch joints, well cross bonded, and the thicker the brick the better and they should be paneled on both sides at least one-half inch deep, to be well filled with mortar which materially strengthens the work, each brick being keyed or locked to each other, and not less than two-brick thick at top of weakest part. The walls should be three-brick strong at spring of arch, the crown having fire clay skew backs, corking two-brick long. The interlining of fire brick, and half the outer retaining wall forming a bond.

In my opinion, it is a mistake to use any underfired brick in the construction of kilns. It is false economy. Kilns are too important and expensive to be skimped in any way.

In kiln building, as in other things, the best is the cheapest in the long run. AN OLD TIME CLAYWORKER.

Greetings From a Former President of the Illinois Clayworkers' Association.

My Dear Old Friend Randall:

I have just received the July issue of The Clay-Worker, and have noted with particular interest and pleasure the personal mention of our old friend, Dr. Converse. I am glad to know that he is still hale and hearty, but am wondering why you left him at the main entrance to the Insane Asylum. I myself am pretty well for a fellow seventy-nine years young, ranking our friend Dr. Converse by four years, and am still trying to make life worth living as best I can. The Clay-Worker comes like a letter from home. I notice that this number is addressed to me with the words, "Once a kiln man." Yes, I was a kiln man in the good old days, and my work as such put me in touch with many high-class men. I shall always honor the craft that makes imperishable goods. I noted with pleasure the photo of my good friend Gates, with his ever-cheerful smile. It is indeed pleasant to have such reminders of by-gone days. I have not heard from our old friend Eudaly in a long, long time. I sincerely hope he is still moving among the living and that he, too, carries his years lightly.

With sincerest regards for all my many friends in the clay-working industry, I am,

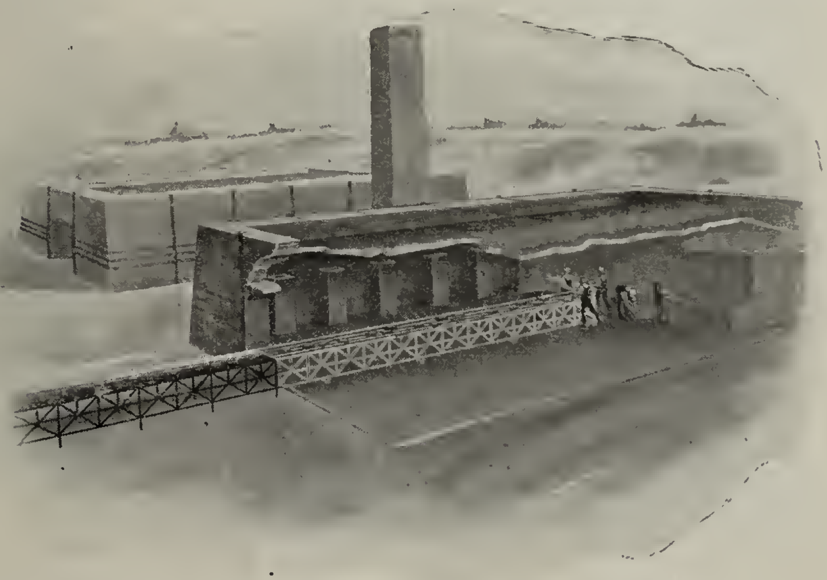
Your friend, as ever,

Chenoa, Ill. E. M. PIKE.

SOMETHING NEW IN LABOR-SAVING MACHINERY FOR THE BRICK AND TILE PLANT.

WE ARE PLEASED TO INTRODUCE to the readers of The Clay-Worker the Leary Sterling Automatic Brickmaking Machinery, now offered to the trade by the W. J. Leary Mfg. Co., Buffalo, N. Y., together with a new line of Conveying and Transmission devices adapted for brick and tile plants, and by which much manual labor will be avoided. By the Sterling system the brick and tile are handled automatically from the time they leave the machine until they are placed on cars for shipment. The system is new and novel in many respects and is not only used on brickyards, but is also adapted to meet any conditions where conveyers are required. Materials either in bulk or package can be quickly and economically handled.

By the use of the Leary Mechanical System of Conveyers, the saving in time and labor over the old system is immense. All such crude and expensive items as wheelbarrows, carts, etc., are entirely eliminated. In a plant of even moderate size the saving on repairs alone amounts to thousands of dollars annually. For further particulars, see ad on page 175 of this issue. A complete catalogue will be mailed on request.



Drawing a Kiln by the Leary Automatic Conveyer System.

Will Adopt Modern Methods of Manufacture.

Editor The Clay-Worker :

We operate at Waterville, Maine, a yard where we make water-struck brick. At present we are using six "Gage" (so-called) machines. Our clay is hauled to the machines in small clay cars a distance of about 100 yards. The brick are dried in the sun and burned in old-fashioned kilns.

Owing to the scarcity of help and increased costs, we are contemplating the installation of modern machinery and modern methods. We would like to have you put us in touch with manufacturers of machinery who would be interested in helping us work out our problem.

Very truly,

HORACE PURINTON COMPANY.

Waterville, Maine.

One trouble with those who are wont to declare that this is a free country is they often make the declaration in a belligerent manner, which is too suggestive of their doing things they know they ought not to.

AUTOMATIC STARTERS FOR INDUCTION MOTORS.

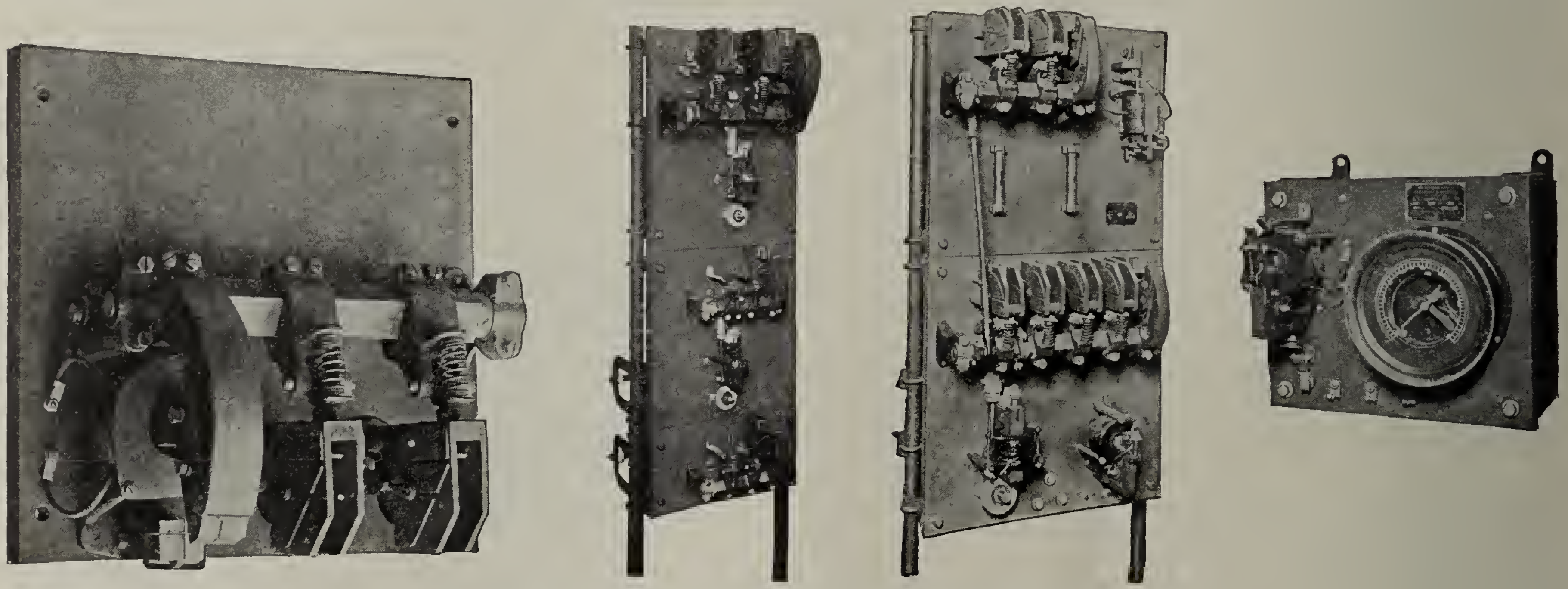
DUE TO THE unprecedented demand for manufactured products of every kind, industrial plants in all parts of the country are being taxed to their utmost capacity. In addition, the cost of labor and machinery has been increasing at an extremely rapid rate. The magnitude of these factors has forced manufacturers to employ every means available in an effort to increase production or to reduce operating expenses. This may be accomplished by reducing the number of operators, by simplifying the duties of the present operators so that more attention may be devoted to the production of a larger quantity and a higher grade of product, or by furnishing better protection to the apparatus installed, thereby insuring continuity of service.

One of the chief factors by which the desired results may be accomplished is the use of automatic starters and controllers for the motor-driven machinery employed. Foremost among the companies producing such control apparatus is the Westinghouse Electric and Manufacturing Company, at East Pittsburgh, Pa., several of whose starters are shown in the accompanying illustrations. These automatic starters are for use with single phase or polyphase squirrel cage and wound-rotor induction motors, where it is desired to start the motor from a remote point or where automatic acceleration is required to guard against improper starting by unskilled operators. They are simple, reliable and rugged in construction, consisting of a magnetic contactor panel and a master switch, which may be either a push button, a float switch, a pressure regulator, or similar device for closing the control circuit, depending upon the service. The vital element is the magnetic contactor. The contactors used on these starters are of a type which has been used by the Westinghouse Company with marked success in steel mill, cement plant, and mine installations where the requirements are extremely severe. The contactors are opened by strong spring action assisted by gravity. The destructive action of the arc is reduced to a minimum by strong blowout coils and arcing horns.

The operation of the starters is very simple. When starting motors during line shafting, wood-working and machine tools and similar apparatus, it is only necessary to press a button, close a small knife or snap switch. The starter then automatically makes the proper connections to limit the starting current to a suitable value and to vary the time required for acceleration according to the load on the motor, thus preventing damage to the machinery by too slow or too rapid acceleration, and saving time by bringing the motor to full speed at the most rapid permissible rate. When used for pump or compressor service in connection with a float switch or pressure gage, the action of the starters is entirely automatic, the motors being started when the pressure or liquid level of the tank controlled falls to a predetermined point and stopped when the desired maximum pressure or level is reached or vice versa.

The automatic starters for squirrel cage motors are most frequently employed for starting motors operating centrifugal pumps, air compressors, fans, blowers, metal working and wood-working machines, and other apparatus requiring starting torque less than full load torque. This type of starter, however, owing to the wide application of squirrel cage motors for industrial service, can be applied economically for starting service in nearly every industry.

Squirrel cage motors of 5-horsepower and smaller are usually connected direct to the line. Large squirrel cage motors are first impressed with low voltage from auto transformers or connected to the line through resistance so that in either case the starting current is reduced. When the speed of the motor has reached such a point that the starting current has decreased sufficiently, the motor is then automatically connected to the line.



Various Types of Westinghouse Electric Starters.

The automatic starters for wound-rotor motors are particularly adaptable for starting motors driving plunger pumps, positive pressure blowers, air compressors, long line shafts, and loads having heavy inertia. The severe starting conditions encountered in this class of service require from 100 to 200 per cent. full load torque in starting, making automatic starting a very desirable feature.

When an automatic starter is used in connection with a wound-rotor motor, the line switch is first closed, with the maximum resistance in the rotor circuit. When the speed falls to a predetermined value, a relay closes a magnetic contactor, which cuts out a part of the resistance in the rotor circuit. Each contactor operates in a similar manner, cutting out its portion of the resistance at the proper time until all the resistance is short-circuited by the last contactor.

The power on any circuit may fail suddenly; it is important that some protection be afforded both operator and motor against an unforeseen return of power. This protection may be provided for motors operating pumps, compressors, etc., by a low-voltage release to disconnect the motor from the line when the voltage is low or power fails entirely. Then, as soon as power returns, the motor will automatically start up again. In many applications, however, such as for motors operating machine tools or wood working machines, low voltage protection is required. Motors so protected are disconnected from the line when power fails and will not start when power comes on again until the operator presses a button or manipulates a similar device. Hence, there is no danger from the unexpected starting of a machine.

The advantages resulting from the use of automatic starters for induction motors comprise absolute protection to both operator and expensive machinery, proper starting at the most rapid permissible rate, economy in operation and maintenance, convenience of remote control and automatic operation.

MILWAUKEE AND WISCONSIN BRICK NEWS.

SO FAR AS the brick manufacturing and merchandising industry of Wisconsin is concerned, it is merely a question of being able to produce and procure a sufficient number of brick to fill orders, and if there has been any reduction in the volume of new construction, as the pessimistic element of the human family would have the rest of the people believe, it has not yet become apparent and neither have the reports caused any considerable alarm. The fact is that the industry in Wisconsin, in common with the rest of the country, has been working tooth and nail throughout the season, and at this time is so far behind on deliveries that there is hardly a chance of the appearance of any effect of possible adversity before the close of the present season.

It is true that the cold, abstract figures of construction work in the cities having building inspection departments do not paint conditions in the same rosy hue as a year ago, but this does not alter the fact that the volume of new construction this year is keeping well up to the average. In Milwaukee, for instance, the building inspectors figures for the first seven months of 1917 show a loss of about $1,600,000 from the same period of 1916, but the figures do not, for obvious reasons, take into account the enormous amount of new construction that has been and still is going on in Milwaukee County, among the many great metalworking industries which are located just beyond the limits of the city to avoid the burden of city taxation.

Milwaukee metalworking concerns have been experiencing the greatest period of expansion during the past six months or a year in the history of the industry. Building upon building is being added to enable the manufacturers to meet the enlarged demands thrust upon them, partly by reason of the great conflict and partly because of the larger requirements of a nation that is growing by leaps and bounds. All of this has taken brick, and an enormous number of brick.

The unprecedented price of structural steel, and the greatly advanced price of reinforced concrete work have been partly responsible for bringing brick back into its own. The number of solid brick buildings now being erected is greater than that of any previous year. For structures of several stories, the familiar "mill construction," of brick and timber, is now in wider use than ever. Taking it by and large, the requirements of the building trades for brick has reached proportions never before approached, and yards everywhere are taxed to capacity to produce the required amount.

In some quarters it has been reported that there has been a slight falling off in the demand for press brick and the fancier types of this material. This may be true to some extent, but it also is true that the demand for common brick is so very greatly enlarged that the loss in the other is much more than offset. As a matter of fact, the demand for fancy brick is practically as extensive as formerly, especially inasmuch as municipalities are undertaking public works, such as school houses, natatoriums, city halls, etc., in spite of high costs of construction, for the reason that the welfare of the communities demand the additional facilities.

In Wisconsin, brick as a paving material has grown more and more in the estimation of engineers, and this season municipalities that never before thought of such a thing, perhaps, have been specifying brick in calling for bids for paving. Concerns like Ricketson & Schwarz, University Building, Milwaukee, which is among the largest dealers in paving and other brick in Wisconsin, state that not in their previous experience have they been called upon to fill so many orders for paving block as this year. A feature of the situation is that the smaller communities are coming into the market for material for permanent road improvements, which makes a large number of comparatively small requirements that amount to an extensive aggregate. The large demand has actually caused a shortage in paving brick. This is especially noticeable in Milwaukee, where certain contracts are delayed by the lack of this material, due both to the shortage of transportation facilities and the inability of makers to turn out enough brick.

Tile manufacturers also have their hands full trying to fill all of their orders. The great movement to make every acre produce a maximum crop has resulted in the undertaking of many drainage projects, large and small. Farmers, whose holding contain marshes have started to lay tile to drain the swamps and make the area fit for cultivation. This movement really is only in its infancy, and tile makers are able to look forward to an enormous call for tile during the coming year.

The labor situation throughout the industry in Wisconsin, as it doubtless is elsewhere, is acute. Skilled labor is at a premium and common laborer demands unheard of wages. Complaint is heard from many points that yards are unable to use all of the facilities available because they cannot get enough competent men to utilize them. The same complaint is heard in other lines of industry and the condition, therefore, is not peculiar to the brick and tile trade.

There has been a demand akin to a scramble in recent weeks because of warnings issued to the public that requirements of the future should be anticipated in plenty of time, lest a serious congestion of transportation next fall, when troops and supplies began to move in earnest, make it impossible for the railroads to handle all of the private business offered. This has been responsible for an accentuation of the movement of brick and clay products since about the middle of July.

J. F. Kies and his son, G. H. Kies, owners of J. F. Kies & Son, 720-724 Merchants and Manufacturers Bank Building, Milwaukee, dealers in brick and other building materials, have organized the Builders' Mortar and Supply Co., a Wisconsin corporation, capitalized at $50,000.

Edwin Wysocki recently was elected vice-president of the Stark Mantle and Tile Co., 819 Twenty-seventh street, Milwaukee. His brother, Theodore, also is associated with the firm. The brothers recently spent their vacation at the home of their parents in Stevens Point, Wis., in which city they learned the trade.

Zerenner Brothers, New London, Wis., have recently made improvements to their brick and tile manufacturing equipment which increases their output from 2,000,000 to 3,000,000 brick per annum. At this time the company is working at utmost capacity and producing about 300,000 brick a day. The season lasts about 100 days, so that it is practically certain that the 3,000,000 mark will be reached this year.

A BADGER.

Missed Chances.

A London divine was entertaining a couple of clergymen from Birmingham at dinner. The guests spoke in praise of a sermon their host had delivered the Sunday before. The host's son was at the table and one of the clergymen said to him: "My lad, what do you think of your father's sermon?"

"I think it was very good," said the boy, "but there were three mighty fine places where he could have stopped."—London Opinion.

KENTUCKY STARTS SOMETHING

The Brick and Tile Manufacturers of the Blue Grass State Mobilize for a Campaign of Publicity.

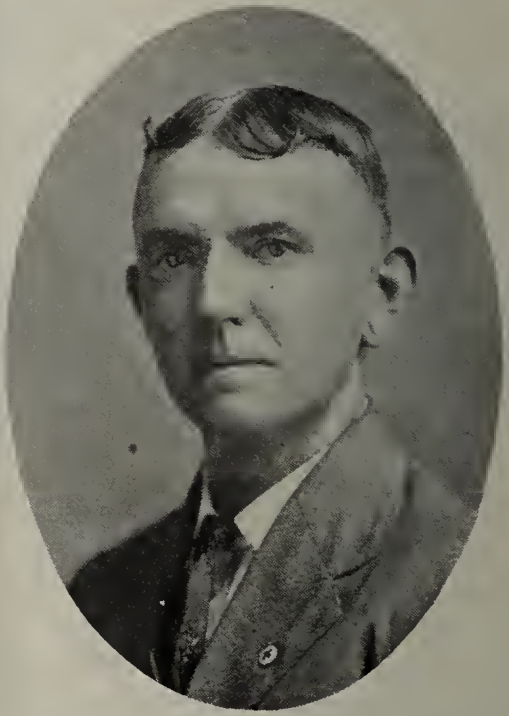
DOWN IN KENTUCKY, the land of Colonels, corn and tobacco, they have started something which promises to put the state on the map in the clayworking industry and help boost the game of the best building material on earth, by forming a state organization to be known as the Kentucky Clay Products Association.

The idea was started by Louisville people and fostered by the Louisville Brick Manufacturers and Dealers Association, and it all culminated at a meeting held at Louisville, July 25, the purpose of the meeting being to consider the subject of forming a state organization.

Only about a dozen out-of-town people were present in addition to the Louisville delegation, but when they gathered in the Gray room of the Tyler Hotel and discussed the subject of forming the state organization the opinion was unanimously in favor of it and the small gathering present, it may be said, represented some of the strongest factors in the brick business of Kentucky.

President, H. C. Cramer.

Chairman, M. J. Bannon.



First Vice President, F. C. Klutey.

M. J. Bannon, of Louisville, was selected as temporary chairman of the gathering and presided at the meeting which formulated the Kentucky Clay Products Association. The formal organization was completed in the afternoon by the adoption of a constitution and by-laws and the election of a board of directors and officers. The directors were elected by the members and the officers by the directors, the result of it all being the following list of officers and directors:

Officers and Directors.

President—H. C. Cramer, Lexington.
First Vice-President—F. C. Klutey, Henderson.
Second Vice-President—Isaac Tyler, Louisville.
Treasurer—J. T. Howington, Louisville.
Secretary—J. Crow Taylor.

Directors.

Three Year Term—F. C. Klutey, Henderson; M. J. Bannon, Louisville; H. C. Cramer, Lexington.

Two Year Term—H. T. Miles, Maysville; A. P. Hillenbrand, Louisville; A. T. Kleymeyer, West Point.

One Year Term—W. H. Hall, Maysville; Isaac Tyler, Louisville; G. R. Ermann, Calhoun.

After the election of officers and directors was completed it was moved and carried unanimously that T. A. Randall, publisher of The Clay-Worker, and secretary of the National Brick Manufacturers Association, be made an honorary life member of the Kentucky organization as a mark of appreciation for his co-operation in the work of organizing.

The visiting brick manufacturers and the architects of Louisville were entertained in the evening at a banquet dinner by the Louisville Brick Manufacturers and Dealers Association. The officers of the Louisville organization are: T. Bishop, president; H. H. Frazier, vice-president; Isaac Tyler, secretary; K. S. Markendorf, treasurer. In the absence of President Bishop, Mr. Frazier officiated at the banquet meeting and introduced the speakers of the evening. The chief speaker was T. A. Randall, publisher of The Clay-Worker, who had come provided with slides with which to illustrate an interesting talk for both brick men and architects upon the durability and fire resisting qualities of brick. Also he was armed with a telegram that stated that the Illinois Society of Architects had wired the Council of National Defense urging that body to recommend that during the war period steel be conserved for other purposes and brick and hollow tile used for building operations.

A number of visitors and architects made brief talks among them being Val Collins, secretary of the Louisville Chapter of American Institute of Architects; Herman Wischmeyer, vice-president of the same organization, and Oscar Joseph, of the architectural firm of Joseph and Joseph.

The forming of this organization marks a distinct step forward in the clayworking industry of Kentucky. This state heretofore has been conspicuous in the building brick industry. The Kentucky clay products of 1915 amounted to a total of $2,441,290, but more than half of this was of clay products which up to this time has constituted the leading item in the clay products of Kentucky. In fact, the value of fire brick constitutes about 54 per cent. of Kentucky's clay products. This continues to gain in importance too, but meantime there is development going on in common brick, and in hollow tile, and the promises for the future are brighter both in the way of prospective returns and enlarged business by this getting together, which, if followed up logically, should result in active promotion of brick and tile for building purposes and the taking of a larger place in the clayworking industry by the land of the Colonels.

Kentucky, in the last reports of the Geological Survey, ranks twelfth in the value of clay products with 78 active operations reporting. Carter county is the chief producer of fire brick, with Jefferson county, in which Louisville is situated, taking second place, and Boyd county third. Jefferson county is the leading producer of common brick, reporting 21,076,000 in 1915.

Among the charter members that participated in the organization of the Kentucky Clay Products Association were the following: Southern Brick & Tile Co., Louisville; Coral Ridge Clay Products Co., Louisville; P. Bannon Sewer Pipe Co., Louisville; Hillenbrand Brick Co., Louisville; Lexington Brick Co., Lexington; Maysville Brick Co., Sphar Brick Co., Maysville; Kleymeyer-Klutey Brick Co., Henderson; Theo. A. Randall, editor Clay-Worker, Indianapolis; Tyler Building Supply Co., Louisville; Geo. Erman, Calhoun; West Point Brick & Lumber Co., West Point; Aubry Corsar, Manufacturers Record, Louisville; R. B. Tyler Co., Louisville.

Secretary, J. C. Taylor.

Second Vice President, Isaac Tyler.

Treasurer, J. P. Howington.

OUR OCEAN-GOING TRADE.

In the face of the submarine and all the devastations these tigers of the sea are said to have been doing, our overseas trade, that is, the exports and imports for the fiscal year ending last June is the biggest thing on record in the history of the country. The total exports for the fiscal year were $6,294,179,555. When to this we add the imports there is a grand total of foreign trade of $8,953,530,240.

The excess of exports over imports for the year is $3,634,828,870. This balance in our favor is of itself a bigger item than our total export trade was before the war period.

Our country has become the greatest producing country in the world, the greatest financial center of the world, and at the present time is doing the greatest volume of overseas trading ever known. Somehow it takes a thoughtful contemplation of these stupendous figures for one to understand thoroughly how the relation of this country of ours to the world as a whole has changed during the past three years. From a very rich isolated country without any concrete ideas of dominating the world's trade, or meddling in world-wide affairs, we have become the greatest factor in the commerce of the world as well as the greatest producer of necessities and the greatest source of wealth.

BOOSTING FOR BUILDING.

There is quite a concerted movement on now by various interested lines to boost building operations in the hope to encourage a resumption of building in that it will furnish employment for those usually engaged in this line of work and will keep alive those industries producing building material and dependent upon building operations for the sale of their product.

The movement includes particularly the brick makers, lumber interests, cement and lime manufacturers, architects, dealers in building material, and contractors and builder's exchanges.

All of these are affected one way and another. The centering of attention upon the war needs of the country caused a great letup in the usual lines of building in midsummer, partly because of interest in other lines and partly because of the scarcity and high price of steel, which has become an important factor in the larger building undertakings.

This phase of it, that of steel as a factor and the necessity for the time being of turning to brick and to mill construction for the sake of conserving steel, was told about at some length in the Clay-Worker for July, so it requires no repetition here to impress its importance or its widespread influence.

The proposition before the clayworkers at the present time is the same as that before the cement manufacturers, the architects and building contractors. It is to encourage more active building that we may not so neglect the brick industry that it will work harm which it will take years of effort to repair.

One of the noticeable tendencies and efforts that have been put forth by other material men is toward a broader vision. This broader vision conceives that while there must needs be rivalry between competing materials for a given form of construction there is today an interest so big and broad that the matter of pushing an individual material is secondary in importance to boosting the building game as a whole. As one correspondent interested in the retail business in building material puts it:

"In this work while all lumbermen will naturally be loyal to lumber let us remember that the public welfare is of more importance than the promotion of any one individual building material. To state it another way, brick is more plentiful today than lumber and instead of brick and lumber people fighting at each other I am striving to get among our people a spirit of co-operation between all classes of building material to the end that the business of building may be kept going, and it is the welfare of the business itself which should be the first consideration and take precedence over the boosting of any one line of material."

Practically the same thing might be said in the matter of rivalry between cement and brick and between mill construction and steel construction, there is in each instance a natural loyalty or leaning toward that product which one is most deeply interested in the production and distribution of. It will always be thus and properly so too. But in the broader vision we should conceive the relation of one building material to another as being comparable with the relation between two men competing in the same business. Here we have long urged that the order of sharp competition which leads to "throat cutting" in various ways be dispensed with and a new order of co-operation to be built up retaining in it a friendly rivalry that will stimulate effort and ingenuity for the sake of creating new ideas and developing new features, but will not run to the point of commercially destructive warfare.

There is an opportunity in the present need for all to join hands to boost the building game for a closer getting together of all those interested in the production of building material and its fabrication and structure even including the architects who design. The big thing for all is the upbuilding of the country and the maintenance of prosperity by keeping the interest in the building operations alive.

Plainly it is not time to boost for the building of sky-scraping office buildings requiring immense quantities of steel construction, so there need be but little effort wasted in this direction. It is a time, however, for the erection of many new factory buildings and warehouses to accommodate the needs of the day in various lines including manufacturers that are enlarged on account of the war, and warehouse room is required for storing products here and there and everywhere.

An example illustrative of this line is furnished by a recent news report of several million dollars to be spent in erecting a new oil refining plant. There are many other plants of various kinds which need enlarging, many new plants will be required to supply war needs and with the heavy burden of traffic all around there is evident need for more warehouses and freight terminals around the railroads. So that taking it altogether the larger cities furnish their opportunities to promote building operations. It is in different channels but the opportunities are there just the same and should be developed.

Among the smaller towns and the country districts the opportunity comes through the great era of prosperity and the high price that farmers are able to realize for their product. It is a great time for promoting building operations in the rural sections to include everything from hog houses to homes of even palatial order. It matters not that some of the building material comes higher. There is none of it comes high compared to the price the farmer is able to realize for his product. To state it another way the farmer can better afford to build today, even paying higher prices for much of his material than he can during normal times, for his income is so much greater than in normal times that the burden of building will really be lighter. The work before those interested in promoting building operations is to drive this fact home and stimulate more activity in actual building.

In the matter of the broader vision, of this cutting down of vicious fighting of one material against another, the clay-working industry can enter freely with full confidence because in the final analysis there is a bigger field in the future before the clayworking industry than any other line of building material, and it not only has the advantages of permanence and fireproofing qualities but in the present day it also is favored by the fact that comparatively speaking it is the cheapest building material to be had. It has increased less in price than other materials, it has gained in quality, and in the future this fact will become more strongly impressed right along that it is the cheapest and most easily available and can stand on its own merits in comparison with other offerings for construction.

A BRICK BOOSTER OF TEXAS.

As a break in the monotony of the daily grind as manager of a large brick manufacturing plant, A. J. Kautz, the genial and efficient manager of the Elgin-Butler Brick & Tile Company, Butler, Tex., entertained about sixty live wire business men when they arrived at Butler on one of their periodical boosting trips. Mr. Kautz had arranged a little program, and after music by a band, and some speeches took the visitors on a trip through the big plant which was a revelation to many of them who were not informed on the subject of brick manufacture, had no idea of the immensity and extent of the Butler plant.

When the party left Butler, Mr. Kautz and his secretary, Paul Leming, accompanied them in his big six, with a full line of sample brick. His car with its large banners "Build With Brick" and "Butler" attracted attention all along the route. In fact, a mayor of one of the towns, after inviting the boosters to distribute their advertising matter, warned Mr. Kautz to be a little careful about throwing out his brick. The accompanying photo shows Mr. Kautz just as he is ready to start out on the trip.

A. J. Kautz, Butler, Texas.

ATTENTION SEWER PIPE MANUFACTURERS.

A story appearing recently in the Builders' Review of New Orleans about testing cement sewer pipe in that city suggests that there is need for some mission work on the part of the makers of burned clay sewer pipe in the way of trade development in that territory.

The story in question says that the nearest points at which clay pipe can be obtained are Birmingham, and Texarkana, and the cost of shipping is considerable, therefore it is thought that the city offers a splendid opening for the development of a big industry in the making of concrete or cement sewer pipe.

Anyway a series of tests were tried out with cement sewer pipe and quite a lot of interest was for a time at least centered around the subject of developing cement sewer pipe for New Orleans. Somehow we find it hard to accept the idea that the burned clay sewer pipe people have been neglecting any such a market as New Orleans. If they have it is time to get on the job.

TAKE CLAY ACROSS THE JAMES RIVER BY AERIAL TRAM.

THE PLANT AT GLASGOW, VA., owned by the Glasgow Clay Products Co., is now in operation and is producing very excellent red face brick in smooth and rough texture effects. The company has adopted the term Va.-Tex as a trade brand for its ware. In addition to brick, it has been discovered that hollow tile can be made successfully and the equipment necessary to produce it is being secured.

Glasgow station is a point on the Norfolk and Western R. R., but as a matter of fact, the brick plant is located on the Chesapeake & Ohio R. R., near Balcony Falls station, the two places being but little more than a mile apart.

The brick works property lies on both sides of the James river, the shale and clay being on one side and the plant on the other. There is brick making material in very great abundance and this is carried across the river by means of an aerial tramway, and discharged at a point more than 20 feet above floor level, making a gravity feed to the grinding machinery a very easy matter.

Plans for the works were prepared by Messrs. E. M. Freese & Co., Galion, Ohio, who also supplied the equipment. The machinery outfit includes a 9-foot dry pan, model P-6 pug mill, model KC auger machine, with pug mill combined, model C-30 rotating automatic cutter, waste ends conveyor, etc. Electric power is used to operate all machinery, and the current is being furnished at a reasonable rate by a local company, part of whose supply is secured from a dam in the James river within two miles of the brick works. The machinery equipment is considered complete and modern in every respect and no trouble whatever was experienced in starting it in operation, perfect brick being made at almost the first revolution of the auger.

The dryer is of the radiated heat type, equipped with metal plate arches and with a furnace for each track. The present unit consists of three double track tunnels, constructed with reference to future additions. Double deck steel cars are employed.

Three 30-foot round kilns have been completed, two are now under construction and others are to be built later. A building in which to store finished product has also been erected.

The Glasgow plant is well located, and there is no doubt about the product finding a ready market. The brick are an excellent color and in quality compare favorably with those shipped into Virginia from Pennsylvania and Ohio factories.

Mr. C. H. Locher, whose office is at 120 Broadway, New York City, is president of the company and principal owner, and in this connection it is interesting to note that part of the building in which the brick machinery is housed formerly contained equipment used for the manufacture of natural cement, the rock from which it was made having been mined on the property. It is told that this industry was started more than 50 years ago by the father of Mr. Locher.

BRICK COMPANY STARTED OPERATING AUGUST 1.

The Lake Shore Shale Brick Company, which recently took over the entire plant and property of the defunct Ashtabula Shale Brick Company, started operations at the plant on Wednesday, August 1.

The concern will at once begin the manufacture of common, rough face and paving brick. It is the purpose of the new concern to get a high class organization of workmen, and to increase the labor capacity as rapidly as possible. The plant, idle for months, has been put in ship shape and all is ready for a flying start.

NOTES FROM DIXIE LAND.

MEMPHIS and vicinity, with the approach of autumn trade, shows more actively than the summer time, with building projects of a large character looking into the coming year. The favorable vote on the city auditorium and market, just recorded, insures a structure of several hundred thousand dollars in the next year or two, at the latest. A big theater project is still in embryo. Some structures of moment are being completed, notably the Van Vleet Mansfield wholesale house at S. Second and Gayoso and the seven-story Goodwyn Institute addition. The last has considerable brick and tile work. It is an auditorium, library and office structure, the addition in the rear from Madison St. running around Third St. Brick residences, especially of the bungalow type and some large ones in Morningside Park are going up but not as many as this time last year. News has just been given out that an aviation camp will be located at Millington, near Memphis, and this will perhaps be the permanent aviation school of the government with thousands of trained aviators stationed there for years to come. The site has also been selected the last few days for the new sub-post office station, almost opposite the Union Depot of the Louisville and Nashville, Southern and Iron Mountain lines. Work on the Boyd Bldg., principally a steel structure, is under way. The Memphis Amusement Co. has been chartered to build a skating rink on the order of the Chicago ice palace. The contract has been let and work started on the brick addition to the Baptist Memorial Hospital, on Madison Ave. C. O Pfeil, of Memphis, is the architect and the Jas. Alexander Construction Co. are the contractors.

The Memphis Brick Supply Co. in the Goodwyn Institute, report a good trade in fancy brick, local and out of town.

J. C. Lovelace, for many years connected with the sales department of Jno. A. Denie and Sons Co., has opened an office at 334 Scimitar Bldg., where he will conduct a business of his own building material and coal in carload lots.

J. T. McKinney, Exchange Bldg., is showing an extensive line of fine house building brick and has filled several handsome contracts the past few weeks in local territory.

Some brick school structures are to go up this fall in Shelby county. A number of remodeling jobs on Main St. in which brick is being used about the fronts are noticed.

Athens, Ala., is to have a new $40,000 hotel of brick. C. E. Frost, of the First National Bank, that city, is the prime mover in the enterprise.

C. Sparks, of McKenzie, Tenn., reports the pottery business active on jugs, jars, vases, etc. His son, Ellery Sparks, and chief assistant, has volunteered for the military service. His other son, Harold Sparks, formerly with the pottery there, is now traveling for the Nashville Pottery Co. in the southeast.

The Johnson-Porter Clay Co., at McKenzie, Tenn., is active in making clay shipments from that place in carload lots. Large mines are located just east of the town and also at Henry county points. Mr. Younkins is manager of the office and has just opened quarters over the new post office on Lee St., McKenzie.

Erection of a 32-room brick hotel building, three stories high, at Earle, Ark., has been started by D. L. Crouch, contractor of Memphis. Cost, $35,000. S. J. Weigel, of Memphis, is the architect. The building is being erected by the Commerce Hotel Co. H. A. Morrison, of the Bank of Commerce, is president.

Architects Jones and Furbringer, of Memphis, have drawn plans for an addition to the Germantown school, Shelby county. This will be of brick.

The plant of the Paducah Pottery Co., at Paducah, Ky., was damaged by fire early in August to the extent of several thousand dollars. The fire started in the second story of the brick warehouse. The loss is covered by insurance. S. T. Howard is manager.

DIXIE.

IS YOUR STEAM SHOVEL A "ONE-HOSS SHAY?"

YOU remember the one-hoss shay?" asked Mr. Vicary. "Each part was made to outlast every other part—every detail was stronger than the corresponding detail of an ordinary buggy. The result was that it kept running along year after year, lasting several times as long as a common ordinary 'shay.'

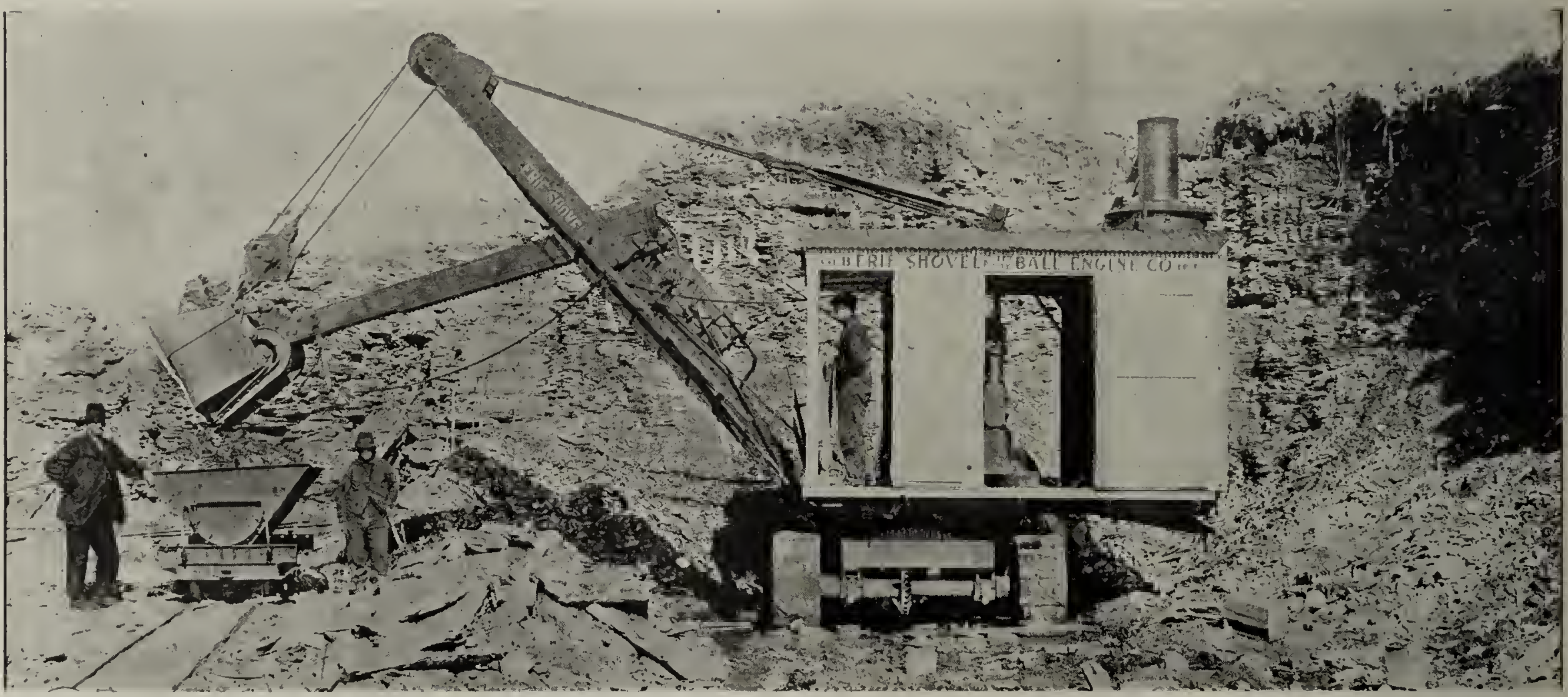
"Well, why shouldn't it pay to build machinery like that for digging clay and shale? We believe that it **does** pay. A steam shovel with stronger construction of every part—with far larger bearings than have ever been used on a ¾-yard shovel—with more metal and better metal at every point of wear and strain. Is it worth while?

"It has proven well worth while for the Bradford Clay Products Co., of Bradford, Pa., who own three Erie shovels; it pays the Duffney Brick Co., of Mechanicsville, N. Y., who own two, and John H. Ward & Sons Co., of Pittsburgh who own two Eries. Also a number of brick yards who have just bought one Erie so far—but will buy their second the next time they need a shovel."

Mr. A. C. Vicary is sales manager of the Ball Engine Company, builders of the Erie shovel, and he states that he doesn't know how long an Erie will last—**nobody knows.** "The first Erie has seen so much hard work that you would expect it to be on the scrap-heap—but it isn't," he said. "It will take a good many more years to wear that old shovel out, to determine just how many years we can depend on as the life of this 'one-hoss shay' of steam shovels.

"But we **do** know that the brick yards who are using the Erie have practically eliminated shovel breakdowns, and tie-ups for repairs. The Erie is giving them bigger outputs in hard shale, and **is doing her work with ease!"**

The Ball Engine Company has an advertisement of the Erie shovel on page 113 of this issue.



Erie Steam Shovel in Operation at the Plant of the Dunn Brick Co., Erie, Pa.

WHY NOT THIRTY?

In the statistics of the brick industry for 1915 as published in The Clay-Worker, the figures of the United States Geological Survey show the average price per thousand of common brick increased only three cents, from an average of $6.12 in 1914 to $6.15 in 1915. Did you get that point, the point of three cents increase and let it soak in thoroughly. Then consider the increase in values that has gone on all about us throughout the past two years. There are increases in lumber ranging from 10 to 25 per cent., in cement of about 20 per cent., and in some of the metal lines from 100 to nearly 1,000 per cent. while this increase in brick prices reduced to a percentage basis would dwindle into a small fraction, that is a fraction of 1 per cent.

Why not 30 per cent. instead of 3 cents? A 30 per cent. increase on the average price of common brick would mean a round price of $8 per thousand. There are some men in the trade who are getting this, some who are even getting better than this, consequently there must be many in the trade who are getting considerably less than $6.15 to bring the average down to that figure. Think what it would mean to the clayworking industry as a whole if we would but boost those brick prices up 30 per cent. and bring the average up to around $8. There would be nothing out of line about it either because other building material and other necessities of life have increased not only during the past two years but in previous years while brick has been dragging along in the low notches generation after generation. It seems to be time for an awakening in the brick industry to the needs of putting the business upon a profitable commercial basis and increasing prices of common brick to where the industry will yield substantial returns.

There will always be need for some difference in brick prices because in some localities the cost of production is greater than in others so that it will never be practical to make common brick prices uniform the country over. It should be possible, however, and practical also to realize better prices. People are doing it in other lines of industry and that department of our government known as the Federal Trade Commission is ready and willing to co-operate with the brick industry to the end that we may get fair prices and satisfactory profits out of the business. Why not get busy, get together and make it a 30 per cent. increase?

The A. C. Ochs Brick & Tile Company, Springfield, Minn., writes that while the building condition in that territory dropped off considerably last season, they still find there is plenty of new business to be drummed up, such as permanent farm buildings, including silos, milk houses, garages, hog houses, chicken houses, water tanks, etc. The drain tile business has been very good, and taken all in all, they have no complaints to make.

QUESTIONS OF INTEREST TO CLAYWORKERS

ANSWERED BY J. J. KOCH.

Question: Can you tell us the price of paper clay f. o. b. shipping point and f. o. b. Chicago? Also, can you tell us the price of ganister f. o. b. shipping point and f. o. b. Chicago?

Answer: The price of paper clays varies considerably with the color. A very high grade clay of a pure white color, under the present conditions may bring $10 per ton f. o. b. cars. This class of clays is greatly in demand, inasmuch as shipments of English kaolin are difficult to secure. This demand, however, is very discriminating and the material must not only be of a pure white color, but also free from grit which would seriously injure the calender rolls. At the present time the Georgia kaolins are being used in large amounts for this purpose. There is no particular demand for paper clays which are not of a good white color, as there is an abundance of such materials available in a number of the Eastern states. The domestic crude clay to be of value for paper manufacturing must be of a good white color, free from grit and mica, and contain from 40 to 45 per cent. of alumina.

Concerning ganister, we can not give definite information concerning its price per ton, since most of the properties are being owned by companies manufacturing the rock into silica brick. It is very unusual that ganister is sold by miners to producers of silica brick, since the latter invariably aim to control one or more deposits. This applies particularly to the Devil's Lake ganister of Wisconsin, and to the Tyrone and Lewistown ganisters of Pennsylvania. For this reason we can only give you a rough estimate, which would be $1.25 per ton f. o. b. cars. It is doubtful whether more could be secured for this kind of product.

Questions of Interest to Clayworkers.

Is there a short method by which different coals can be compared as to their approximate fuel value for the proximate analysis?

For instance, here are three coals offered of the following analysis and price:

No. 1.

Fixed carbon	56.4
Volatile	24.4
Moisture	1.1
Ash	18.1

Price, $5.30 per ton.

No. 2.

Fixed carbon	44.5
Volatile	26.6
Moisture	12.6
Ash	16.3

Price, $5.50 per ton

No. 3.

Fixed carbon	44.
Volatile	32.5
Moisture	16.5
Ash	7.0

Price, $4.75 per ton

Kindly point out which should be most economical coal to use and the method to use in judging fuel value from proximate analysis.

Answer: The above stated proposition may be looked after by using the following:

Factors.

14,544 B.t.u. as combustion results of 1 pound of Carbon.

23,600 B.t.u. as average combustion results of 1 pound of Hydro-carbons or Volatile Matter.

970 B.t.u. as loss, owing to latent heat developed in steam, coming from mentioned moisture.

No. 1.

Fixed carbon	56.4×14,544=	820.281.6 B.t.u.
Volatile Matter	24.4×23,600=	575,840.0 B.t.u.
		1,396,121.6 B.t.u.
Moisture loss	1.1× 970=	1,067.0 B.t.u.
100 pounds coal produces		1,395,054.6 B.t.u.

1 ton of coal at $5.30 per ton=26.5 cents per 100 pounds.

Problem.

If 1,395,054.6 B.t.u. cost 26.5 cents, what will 1,000,000 B.t.u. cost?

18.99 cents as per following equation:

1,395,054.6 : 26.5=1,000000 : ? Answer 18.99.

No. 2.

Fixed carbon	44.5×14,544=	647,208.0 B.t.u.
Volatile matter	26.6×23,600=	727,000.0 B.t.u.
		1,374,968.0 B.t.u.
Moisture loss	12.6× 970=	12,222.0 B.t.u.
100 pounds coal produces		1,362,746.0 B.t.u.

1 ton coal at $5.50 per ton=27.5 cents per 100 pounds.

Then, as shown by equation method in No. 1—1,000,000 B.t.u. will cost 20.18 cents.

No. 3.

Fixed carbon	44×14,544=	639,936 B.t.u.
Volatile matter	32.5×23,600=	767,000 B.t.u.
		1,406,936 B.t.u.
Moisture loss	16.5× 970=	16,005 B.t.u.
100 pounds coal produces		1,390,931 B.t.u.

1 ton of coal at $4.75 per ton = 23.75 cents per 100 pounds.

Then, as shown by equation method in No. 1—1,000,000 B.t.u. will cost 20.18 cents.

But—

there are other things to be taken into consideration, not only the first naked cost of the coal. For instance: Does one kind of coal slack up more readily than the others? Then, if such coal is to be used—grates would not be of good service and a coking table attachment would have to be resorted to, in connection with the usual grate service, otherwise the fine slack coal would be lost in a great measure, by dropping through the grates. Lump coal is essentially the best fuel to use on grates, yet the writer knows of an instance where slack coal, used in connection with coking tables, gave better results than when the lump coal was burned directly on grates. The equipment governs the grade of coal, which may be used satisfactorily and economically and this part of the brick manufacture should be looked after intelligently, or the present high prices of coal may be the cause of excessive high manufacturing cost.

Then the construction of kilns and fireboxes as well, may govern the type and physical condition of coal which is best to use. The kind of clay and the type of ware made therefrom, in a great measure, govern the kind of coal which should be used. Thus, it often happens that a certain style of firebox works very well with a certain kind of coal and a certain kind of clay used to make a certain kind of ware, yet with the same kiln equipment and another kind of clay or fuel, the kiln operation plan may prove a complete failure.

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THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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☞Subscribers when ordering a change of address should give both the old and new address.

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Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T. A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVIII. AUGUST, 1917. No. 2.

My Country, Right or Wrong—My Country!

CURRENT COMMENT.

Business as usual.

* * *

There is a big crop of exemption claims.

* * *

The biggest business of the day is war, but other business is necessary to support it.

* * *

It is a good time to tell the farmer that a brick home is a splendid monument to progress in his community.

* * *

The present indications are that the softest prices on soft coal will be found during the latter days of August.

* * *

Arguments and reasoning count for something and the literature helps a little, but the big and effective urge for the farmer to produce more is found in the fact that he can obtain high prices for his product.

* * *

Some good advice on the conservation of foodstuffs is being given out from Washington, and then again some of that offered to farmers' wives about canning and preserving reminds us of an old saying about teaching grandmother to milk. If more of those advisors had been raised on the farm they would know better.

* * *

The Colonels of the brick trade down in Kentucky have mobilized for better team work in promoting the clayworking industries.

* * *

If those I. W. W. agitators keep agitating and gaining followers there will be work for the home guards to do before the winter is over.

* * *

One of the interesting and worth-while objects to observe and study during the vacation rest is self, for self-knowledge is one of the first aids to proper understanding of others.

* * *

One of the good signs of the times is found in the fact that the hysteria of emotion is passing and we are settling down to a more thoughtful consideration of all the problems before us.

* * *

There has never been a time in the history of the industry when Build with Brick signs were more appropriate or more urgently needed than right now. Get busy and put some up in your community.

* * *

The true meaning of the word "economy," which we hear all around us today, is conservation. Conservation in building means, among other things, safety against fire and durability against the ravages of time. Build with Brick.

* * *

There is a whole lot of land in the country that can be made better and more productive by tile drainage and there should be an active promoting of farm drainage work this fall and winter, to the end that we may have bigger crops next summer.

* * *

Those labor leaders at Washington and elsewhere who made such full promises for the loyalty of labor should live up to them and use their influence to prevent strikes. Strikes are bad things any time, and they should not be tolerated during war time.

* * *

The merchants of the country are now spending a lot of time, ink and argument to undo a lot of bad practices in connection with delivery and returns that they themselves were responsible for. And it is really they and not the people who need to absorb the arguments.

* * *

When the schools open again this fall there will likely be more than the usual centering of attention upon engineering departments so it is up to the clayworkers in every community to see that burned clay in its various forms is made available for study and experiment.

CERAMIC SOCIETY ASSOCIATES.

A circular letter of appeal from Ross C. Purdy, chairman of the membership committee of the American Ceramic Society, serves as a reminder that every man in the clayworking industry who is not already should become an associate of the American Ceramic Society.

This society has been of wonderful service to the clayworking industry in various branches in the past, and right now it is in a position to be of even more important service because of the necessity for developing native resources and industries in many lines that heretofore have come from abroad.

The fees and dues for associate membership are very modest indeed and any man actively engaged in business can afford this membership, which will bring him in return many facts of value in the business. A great membership means a bigger fund with which to work as well as a wider interest, so both the value and the usefulness of the organization will increase from the increased membership.

HOW TO TALK GOOD ROADS.

Practically every clayworker is a good roads advocate. The brick man is naturally for a brick paved roadway first, but entirely aside from that, the brick people are great pluggers for good roads. For the benefit of those who may be called upon from time to time to make talks on the subject of good roads in the hope of encouraging the cause the States Relation Service of the Department of Agriculture at Washington has published a sort of standard lecture which will help out in the furnishing of specific points for consideration in talking good roads. The publication was prepared for the U. S. Office of Good Roads and contains a series of notes on all features of the subject from the initial work of arousing sentiment to the maintenance of roads after they are built. So far as known, this is the first production of what might be termed a hand book on the subject of how to talk good roads, and it is evidently a publication that should be in the hands of every man who starts out to preach the doctrine of good roads, whether he is to speak before civic improvement associations or knitting circles. The director of the U. S. Office of Public Roads is Logan Waller Page, Washington, D. C.

A TON OF COAL AND A THOUSAND BRICK.

Since coal went skyward there are times, thoughts and feelings which point toward the brickmaking industry being more of a coalworking industry than a clayworking industry. Broadly speaking, many in the trade figure that it takes a ton of coal to make a thousand brick. This ton of coal has for nearly a year now been such an expensive item as to overshadow even the original cost of raw material in the brick itself.

Figuring a ton of coal for 1,000 brick every dollar increase in the price of coal means a dollar increase per thousand in the cost of brick. Naturally, under such conditions much interest centers on the prospective future price of coal, and also in possible ways and means to reduce the volume of coal consumption necessary in burning brick.

This should be a great time for the kiln men, especially those who have offerings that will work actual economy in fuel. It is not a time for promoting wild ideas or untried schemes, but brick makers everywhere are vitally interested in almost any and every kiln proposition which can demonstrate an actual saving in coal. There is a feeling that while in time we may have a reduction in coal prices to something like the old figures, meantime there is a natural and commendable desire to get out from under this high burden of coal cost by the installation of kilns and burning systems which will make it practical to turn out 1,000 brick with considerably less than a ton of coal.

THE JAR AND THE JUG.

Earlier in the season we ventured the remark that it should be a good year for reviving interest in jars, crocks and jugs because of the scarcity and high price of tin for cans and also the higher price and limited output of glass. Reports and inquiries coming in since have served to confirm this thought and to impress the idea that there has been a considerable revival of interest in earthen ware, fruit jars, syrup jugs and crockery generally.

This line of clay products was always a splendid line but it lost in prominence and favor a few years back mainly through the active exploitation of glass and tin. More attention to exploiting the product and to bringing out new and novel ideas would perhaps have served to keep this branch of the industry in greater standing even in competition with other material before the war. Now that it is being revived, that branch of the clayworking industry devoting itself to jugs, jars and crocks should profit from past experience and come to a fuller realization of benefits to be derived from publicity and the importance of holding public interest by continued exploitation of the product. Active and intelligent boosting with a reasonable amount of attention centered on novelties and new ideas should serve to hold and build up this trade even when peace comes and rival offerings are more plentiful.

HELPING INLAND NAVIGATION.

The Council of National Defense is putting it up to the U. S. Shipping Board, and the authorities generally, to render practical help in stimulating the use of our inland waterways for the moving of freight. They are not simply talking and theorizing about it but have put up a practical proposition in the form of the following resolution:

"Resolved, That we request the Shipping Board, whenever in their judgment it is wise to do so, to construct and sell, at not less than cost, to responsible parties and on satisfactory terms as to payment, barges, towboats and incidental marine equipment for use in commercial service on the navigable waters of the United States, to be operated by such private parties in such services and on such routes as will best serve the public needs and afford the greatest relief from freight congestion, and as may be directed by the Government of the United States during the war, and after the war in such services and on such routes as may to such private parties seem best to serve the commercial needs of the country."

This puts it up to those producing along inland waterways who can use these to relieve freight movement on the railroads in shape that they can make something tangible out of it without any heavy burden or sacrifice on their own part. In a way, the government will go into partnership with them in building boats and barges and it should be practical to arrange terms which will make these pay their own way and will make our inland waterways serve a much more useful purpose and help relieve the freight congestion so that our railroads can better handle their part of the traffic needs of the country.

ROOFING.

Interest in the development of burned clay roofing is almost threatening to become a hobby with the Clay-Worker, because there is never a month goes by without something of interest coming to light bringing with it a plea for further discussion of the subject and keeping it alive.

A consular report from England tells of a plant established there for the manufacture of asbestos sheeting, plain and corrugated to be used both for roofing and for paneling. It is claimed the product will be of special value in the work of European construction when the war is over. It will compete with various materials hitherto used, paneling and roofing made particularly of galvanized iron.

The statement goes on to say that this form of roofing was invented twenty years ago but the process of manufacture has been improved recently so that the common fault of lamination, a tendency to peel, no longer exists. The process of manufacture is described as similar to that of paper making. This new asbestos cement offering is a fireproof product in which there is claimed the combination of cement and asbestos fiber that has strength and durability as well as fireproofing qualities.

The impressive point about this is in that it points the strong tendency toward fireproofing the roof. There has been a wonderful development in this country in composition roofing in the form of shingles and sheets, but while this is claimed to not be so dangerous as shingles it is in the main not fireproof because either tar or asphalt is generally used as a binder and once it does get to burning it makes a fierce fire. The turning to asbestos indicates the ever present urge to fireproofing.

We all know and have known right along that the one absolute fireproofing roofing is burned clay. The strange thing about it all is that we see all manner of substitutes being promoted from time to time while burned clay, the one best bet in roofing material as well as in wall construction, is not making the progress it should nor being exploited as industriously as many of its inferior substitutes.

BRIDGEPORT TO ERECT MANY BRICK HOUSES.

The building committee of the Bridgeport Housing Company has authorized the opening up of the large development at Lordship Park, Bridgeport, Conn., where several hundred brick houses are to be erected in the Colonial style. The plans of R. Clipston Sturgis, national authority on the garden city type of development, and who had entire charge of laying out the Fairfield village of 300 homes, will also be used in this connection.

Men, Keep an Eye on Your Pants--- or Your Wife Will Be Wearing' Em!

HEY! BRING BACK THOSE PANTS!
I WONDER WHERE SHE PUT THAT QUARTER
TURNING THE TABLES.
WHEN MOTHER BORROWS THE FAMILY TROUSERS
They say they are going to wear'em soon.

At last, it's come! Pants for women!

Members of the Chicago Garment Manufacturers' Association have decreed them, and are showing them at their style show. They'll be real trousers, with pockets and buttons for suspenders.

The only way husbands will be able to pick their own pants of a morning will be by the colors, unless they're color blind. Women's pants will be green, red and orange mostly.

Don't think they will be worn inside only. They're for the opera and receptions and balls, and for afternoon shopping and calling tours, the designers say.

What will be left for the men, after the women get started with the new style, will be skirts.

—Courtesy Indianapolis Times.

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A WAR CONVENTION OF AMERICAN BUSINESS.

Under the above caption, the Chamber of Commerce of the United States has issued a bulletin, announcing that there will be a meeting of that organization at Atlantic City, September 18 to 21, inclusive, to consider the special problems affecting the business of the United States developed by the war. Members wishing to submit resolutions on any question should present same in writing to the national headquarters on or before September 5. Particulars as to hotel headquarters, meeting places and other arrangements will be announced later.

THE AMERICAN CLAY MAGAZINE FOR AUGUST.

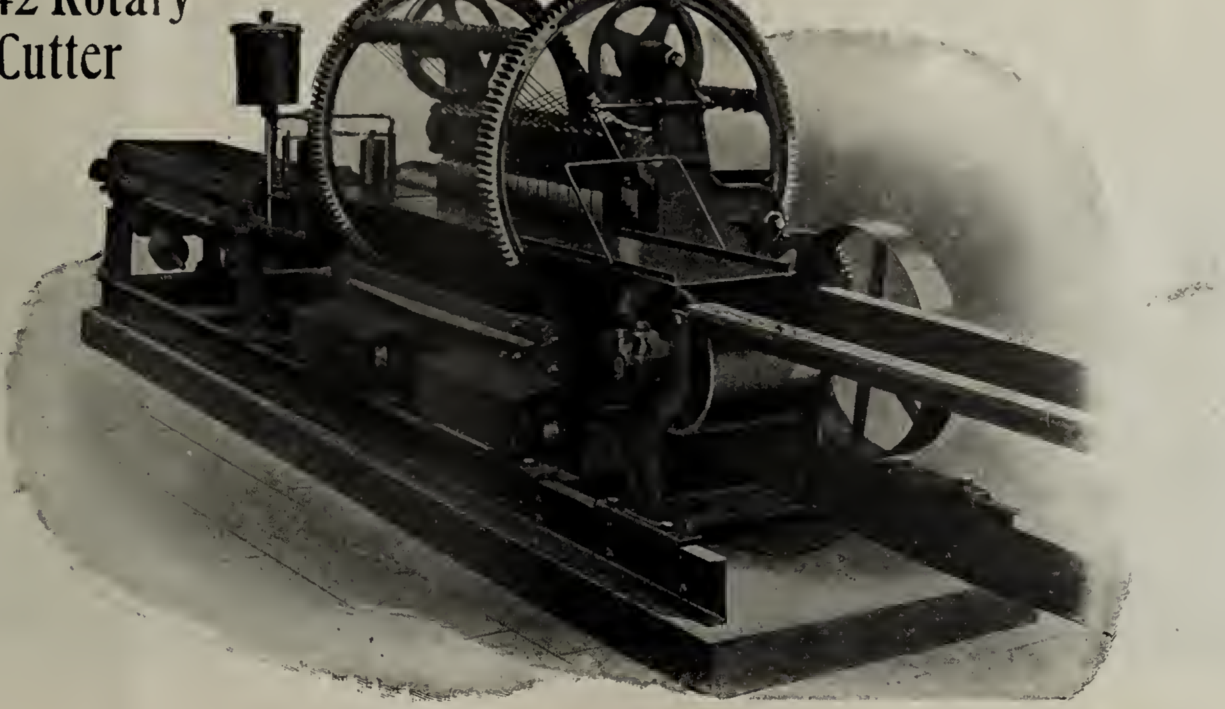
The August issue of the above interesting publication is replete with current news and information prepared in tabular form for the busy clay man. The frontispiece is a timely hit on war vernacular under the head of

In the "Regular Service."

In the "Regular service" of our customers we have "mobilized" trained and loyal forces, equipped with "Rapid Fire" machinery and an abundance of "Metal" advantageously placed to "stand guard" over the successful and profitable "advance" of clay products. We will "arm" you for "offensive" and "defensive" purposes, to "protect" the business you have and "capture" new business. The nation insists on conservation and we can conservate to your financial good and to the good of the nation. We stand at "attention" and will "rally to the call" of your telephone bell, a day or night letter, to a two-cent stamp or a postal card. We are "yours to command." Do we hear you say "Forward March?"

The Magazine is published monthly, and copy can be had for the asking, on application to The American Clay Machinery Co., Bucyrus, Ohio. See ad on pages 165, 166, 167 and 168.

American No. 342 Rotary Automatic Cutter



DEPENDABLE LINE

CHAPTER THREE

When you are in possession of all these facts you can then decide whether you want to invest or not. We want to show you first and then leave it to your own judgment.

We make every machine and appliance needed for the production of Clay Products by Every Process. The machines shown here are representative of the quality in our whole line.

Our Steam Shovel for the clay pit will save you at that point—the starting point in making clay products, and our Haigh Continuous Kiln will finish the manufacturing process by saving half of your fuel and a half of the labor of burning your product.

(Continued on next page.)

"BUILT
RIGHT
RUN
RIGHT"

"BUILT
RIGHT
RUN
RIGHT"

THE HAIGH CONTINUOUS KILN

DEPENDABLE LINE

CHAPTER FOUR

Just at this time when the government is urging everyone to conserve wherever possible, and just now when high prices of brick and other Clay Products have a tendency to discourage building, you ought to be keen for anything that will save on your manufacturing cost. The Haigh Kiln will save half of your burning cost, which puts you in a position to compete better than ever before, or add to your profits.

Have you seen the American Clay Magazine for August? It's a hummer for the clayworkers. Look for the next issue. It's free for the asking.

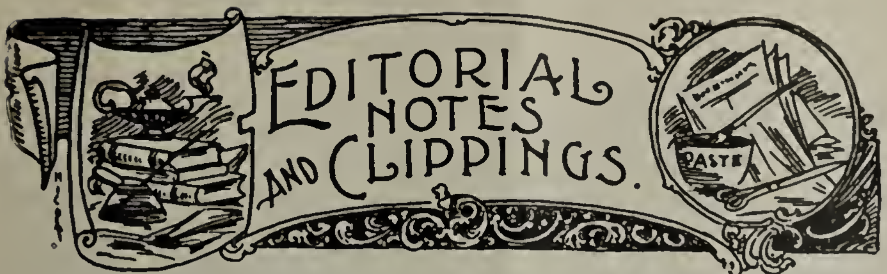
Particulars and description of any machines will be sent free. Do It Now. Write today. It will be a start toward bigger profits and less worry.

The American Clay Machinery Co.
Bucyrus, Ohio

"BUILT
RIGHT
RUN
RIGHT"

"BUILT
RIGHT
RUN
RIGHT"

EDITORIAL NOTES AND CLIPPINGS



The Refractory Magnesite Co., of Pine Mountain, is figuring on establishing a brick factory in Cloverdale, California.

A. F. Wysong, of Princeton, W. Va., would like prices on face brick for a $60,000 court house to be built at Glenville, W. Va.

Thomas Salveson is at the head of a company at St. Petersburg, Ill., which has under consideration the erection of an up-to-date brickmaking plant.

The plant of the Drury Brick and Tile Company, at Essex Junction, Vt., was damaged by fire recently which started in the kiln sheds. The loss was almost covered by insurance.

The P. Bannon Sewer Pipe Company, of Louisville, Ky., recently booked an order approvimating 175 cars of sewer pipe ranging in size from 6 inches to 30 inches for the new government cantonment at Louisville, Ky.

The brick yard at Hooksett, Mass., owned by Eugene S. Head, has been compelled to close down for the first time in over eighty years, owing to a scarcity of labor. The yard was first operated by the present owner's grandfather.

The Thornton Brothers Brick Company, of Rudyard, Mich., will manufacture drain tile in addition to their present product. The farmers have had an unusually good season, and there will be a great deal of farm drainage done this fall, so it behooves tile manufacturers to get busy.

J. C. Steele & Sons, Statesville, N. C., write that regardless of the war, they are busier than ever, and now have on hand in addition to the trade that comes to them regularly from their southern patrons, orders from Missouri, Kansas, Oklahoma, New Jersey, Pennsylvania and other northern territory.

William E. Rivers, owner and superintendent of the Old Bridge Enamel Brick & Tile Co., Old Bridge, N. J., died at his home in that city July 22. Mr. Rivers was born in Staffordshire, England, in 1861, and came to this country when a young man. He had been engaged in some branch of clayworking nearly all his life. His wife survives.

The land on which the brick making plant of the Giles Brick Company is located at Peoria, Ill., has been bought by a real estate company for the purpose of laying same out in building lots. The last kiln of 700,000 brick was finished the last week in July, and the plant will be dismantled. There are thirty-four acres in the site and fourteen acres have already been subdivided into building lots.

The Carlyle and Portsmouth Brick companies, Portsmouth, Ohio, two of the oldest industries of this kind in southern Ohio, have been merged into the Carlyle-Labold Company. The combined capacity of the two plants is 90,000 fire brick daily. George E. Carlyle is president of the new company; Simon Labold, vice-president; Daniel W. Conroy, secretary, and George E. Carlyle, treasurer.

The Diehl Pottery Company is trebling the capacity of its plant at Rock Hill, Bucks County, N. Y. There has been a great demand for the company's tile products, both roofing and hollow brick. The new plant, which is being erected, will have a capacity of 125,000 pounds of clay per day, which will produce an average of between 30,000 and 50,000 hollow brick daily. This will be the principal output after the completion of the new plant, and the installation of the more modern machinery. The new kiln, which is being placed, will be heated by oil instead of coal. This will increase the production and lessen the cost to one-fourth that of the former production. The Diehl Pottery Company is capitalized at $150,000.

The Puritain Brick Company, of Hamden, Ohio, recently booked a contract to furnish paving brick for the streets of Greenville, Ohio.

Peter Stipp & Sons Co., of Dover, N. H., has been incorporated with $90,000 capital stock, to manufacture and deal in brick, tile and other building supplies.

The Trenton Potteries Company, Trenton, N. J., declared the usual quarterly dividend of 1½ per cent. and an extra dividend of ½ of 1 per cent. on its preferred stock, payable July 15 to holders of record July 10.

The plant of the Plymouth Clay Products Company at Fort Dodge, Ia., which was closed down during the general strike in the clayworking plants of that section in May, is again running full force, with plenty of orders.

Lincoln Morrison, treasurer and manager of the Carolina Brick Company, Florence, S. C., writes that the Pee Dee section of South Carolina is in fine shape. Crops will be unusually good this year, and that, of course, will boost the building and brick business.

A mile of what is known as the Harrison trail between Tiffin and Upper Sandusky, Ohio, is to be paved with brick. A $24,000 bond issue will provide funds for the county, township and property owner's share of the work, and the state's share of the improvement will be $12,000.

The plant of the Springfield Drain Tile Company, Springfield, Ill., was completely destroyed by fire recently. W. C. Holmes, the manager of the plant, had plans under way for the reconstruction of the factory within a day or two after the fire. The loss was estimated at about $50,000, which was only partly covered by insurance.

The American Refractories Company, of Baltimore, Md., had a strike at their new plant at Curtis Bay, following an announcement by General Manager Greaves-Walker, that the force would be paid every two weeks. About thirty of the two hundred quit, but after studying over the matter a couple of days the men all went back to work apparently satisfied.

The Utah Fire Brick Company has been incorporated with $200,000 capital. The principal office of the company will be in Salt Lake City. A plant will be erected for the manufacture of brick, stoneware and pottery. The officers of the company are James E. Clinton, president; W. H. Reed, vice-president; T. R. Ellerbeck, secretary, and Lewis S. Hills, treasurer. All of the men are residents of Utah.

In general with all of the potteries of the country, the Brunt Tile & Porcelain & Tile Company, Columbus, Ohio, is experiencing one of the best years in the history of the company. The products, which include floor tile and electrical porcelains, are being shipped all over the country. Some of the land which belongs to the company has been used by its employes this year for gardening, each individual who so requested being allotted an ample piece of land. Officers of the company state that this is proving of benefit to employes in combating the high cost of living.

With much ceremony and in the presence of hundreds of visitors the plant of the Municipal Shale, Brick & Block Company, at Martinsburg, West Virginia, was started. Several young women, daughters of the men interested in the company, took part. Miss Clara Thompson blew the steam whistle as a signal for the opening of the formal program; Miss Philomena Johann pulled a rope which unfurled an immense American flag, and Miss Mildred Aler pushed the button which started the 150-horsepower electric motor and the wheels began to revolve and the manufacture of brick was under way. The plant which is the latest word in brick manufacturing factories is equipped throughout with machinery from the shops of the E. M. Freese Co., Galion, Ohio.

F. Vernon Aler is president of the company and deserves much of the credit for getting this big plant under way.

The Empire Fire Brick Co., of New York City, has been incorporated with $500,000 capital stock. The company will manufacture brick, tile, etc.

James Norton, an employe of the Cary Brick Co., Mechanicsvills, N. Y., fell from a donkey engine which he was running and was so badly injured that he lived but a short time.

Joseph A. Terteling is operating the plant of the Potlatch Brick Company at Lewiston, Idaho, this summer. The plant has a capacity of 20,000 brick per day and Mr. Terteling finds a demand for all he can make.

Edwin P. Wilcox, a stockholder in the company, has brought suit against Amos K. Myers, Harold P. Myers and the Edgerton Brick and Tile Company, asking that the court appoint a receiver to take charge of the business at once.

Thomas Carey, president of the Carey Brick Company, of Chicago, Ill., is a real patriot, as was evidenced recently when he turned over to the government for training camp purposes 200 acres of land valued at $500,000. The land contained the one-time famous Hawthorne race track.

The work of extending street paving into the residential sections of Griffin, Ga., was commenced recently. The plans contemplate the expenditure of $135,820, bricks being the material selected. The work is in charge of D. S. Lewis, superintendent of construction for the Augusta Vitrified Shale Brick Company.

Theodore Kalloway, an employe of the Duetrich & Beutin Brick Company, was quite seriously injured by a cave-in at the clay bank. He was at work loading a clay cart when the bank gave way unexpectedly and the man was buried beneath the clay.

The Wynn & Starr Company, both manufacturers and dealers in brick and building supplies, Trafford, Pa., recently took over the large plant of the Mars Brick & Tile Company, at Mars, Pa. They turn out large quantities of hollow block in addition to a fine grade of common and repressed red and buff building brick.

The Bridgewater Brick Company, of New Haven, has been incorporated by Frank L. Stiles, J. F. Reynolds and Henry F. Redfield, all of North Haven. The company is capitalized at $50,000. With such old and experienced brick men at the head as Mr. Stiles and Mr. Reynolds, there can be nothing but success ahead of the company.

The erection of a new manufacturing unit at the plant of the Onondaga Pottery Company, Syracuse, N. Y., is now under way and will mean an increase of one-third in the company's production. The improvement includes one building one story high, two two-story buildings, and three four-story buildings. Two of the buildings will contain four new kilns. It is estimated that by December 31 the output of the company will reach 7,800,000 pieces of china of various sizes for domestic use.

Organized with a capitalization of $20,000 to take over the plant of the Tri-State Development Co., Ironton, O., the Iron Firebrick Co., of that city, soon will commence regular production, although the Tri-State plant has been idle for several years. The new company will produce 15,000 fire brick and 30 tons of fire clay daily. Following are the officers: H. A. Marting, president; A. C. Steece, vice-president, and C. C. Hayward, secretary, treasurer and general manager.

The controlling interest of the Reading (Pa.) Fire Brick Works, corner Fourth and Canal streets (McHose & Co., Inc.), changed hands at a recent stockholders' meeting. The resignations of William McHose Boyer, as president, and Wilson V. McHose, as treasurer, were accepted and the following men elected to succeed them: J. Heber Parker, president; Joseph S. Pendleton, treasurer; John W. Sterner, secretary and assistant treasurer. William McH. Boyer remains with the company as manager and no changes in the operating staff are contemplated. The plant was established in 1845, and has been in continuous operation ever since.

The Philadelphia Vitrified Brick Company of Philadelphia, Pa., has been organized with $75,000 capital. J. T. Hawthorne is at the head of the concern.

The plant of the Paducah Pottery Company was damaged by fire to the extent of about $3,000. The fire started in the second story of the brick warehouse. The cause is unknown. The loss is fully covered by insurance. Manager S. T. Howard is of the opinion that the fire was started by a burglar.

W. W. Lewis, president and treasurer of the North Baltimore Clay Company, writes that following the fire which destroyed the plant of the Hoytville Tile Company, the company was re-organized under the former name and a new plant is now being erected at North Baltimore, for the manufacture of drain tile, hollow brick and hollow block. C. C. Lewis is secretary of the new company and H. J. Everitt is vice-president.

Three damage suits were filed recently against the Ohio Clay Products Company, at Salineville, Ohio, by adjacent property owners, in which the plaintiffs claim that the brick plant is a nuisance on account of the smoke, gases, etc., emitted from the stacks, and that lawns, gardens, fruit and shade trees have been destroyed. Pending the trials, an injunction has been filed refraining the brick plant from being operated in such a manner as to be a nuisance.

L. Perry West, of West Brothers Brick Co., seems to be (if one may make so bold) the present man of affairs in the brick line in Washington, D. C., although he modestly disclaimed the honor to The Clay-Worker scribe. His greatest trouble seemed lack of drivers for his teams, complaining that there were eighteen horses or mules in the yard at one time for which no drivers could be procured, all of the latter rushing madly to the cantonment. He has eventually solved the difficulty by using motor trucks. Following is a short list of some of his operations: Apartment Hotel, 27th and Woodley avenue, one million red brick; National Savings Trust, 15th and New York avenue; Commercial National Bank. Mr. West is dodging contracts rather than hunting them, selling to old customers only.

R. T. STULL RETURNED TO COLUMBUS.

We are in receipt of an announcement from Ray T. Stull to the effect that he will sever his connection with the Dunn Wire-Cut Lug Brick Co., Conneaut, Ohio, September 1, made necessary by his appointment as chief ceramist of the United States Bureau of Mines, and superintendent of the government ceramic experiment station to be located at Columbus, Ohio.

BOOK OF SMILES.

As usual, the current issue of the Book of Smiles is brimful of clever things, which makes it an admirable first aid to troubled clayworkers. Commenting on current events, it remarks, "The girls are responding nobly to the call for economy by shortening the skirts of their bathing suits."

Of course there are references to the war. The following appears under the head,

"Ain't the Men Terrible?

"An old lady was introduced to an army officer. 'Colonel,' she said, 'I am told you are a bachelor. But I suppose you will marry after the war.' 'No, madam,' answered the blunt soldier, 'after the war I want peace.' "

The editor of Smlies might have pointed a moral by adding "Peace and contentment comes to the brickmaker who is using a Standard dry kiln"—see ad on page 120 this issue, for further particulars.

Oak Park Lane, Columbus, Ohio. Filling joints of brick pavement with Barrett's Paving Pitch.

Barrett's PAVING PITCH

Paving Pointers

IT may be possible to lay a brick pavement with cement filler that will always be a credit to its builder, but even the best municipal engineers are constantly getting into trouble with that combination. Cement filler attempts the almost impossible feat of restraining the brick from expanding in hot weather.

Shrewdly planned lateral and transverse expansion-joints at the proper intervals and angles may serve to prevent the expansion of the pavement from thrusting the curbing out of line, or from causing trouble at manholes, railway tracks, etc. The placing of such expansion-joints, however, is far from an exact science; moreover, the joints themselves are sources of trouble, for they must necessarily be wide, inasmuch as they must account for the expansion of a considerable area of bricks.

In cold weather such expansion-joints are so wide that they form a groove across the pavement, exposing the edges of the brick, which crumble under traffic.

If the foundation settles ever so slightly, the brick monolith does not settle with it, but remains suspended in the air. Hollow sounds when vehicles pass over such areas betray the existence of the settling, but there is no help for it, and the engineer can only wait helplessly until some day the insufficiently supported brick breaks down under a heavy load and makes a wide, ugly crack. If there is a curve in the road the expansion problem is particularly tricky, and frequently the most elaborate management of expansion-joints will not suffice.

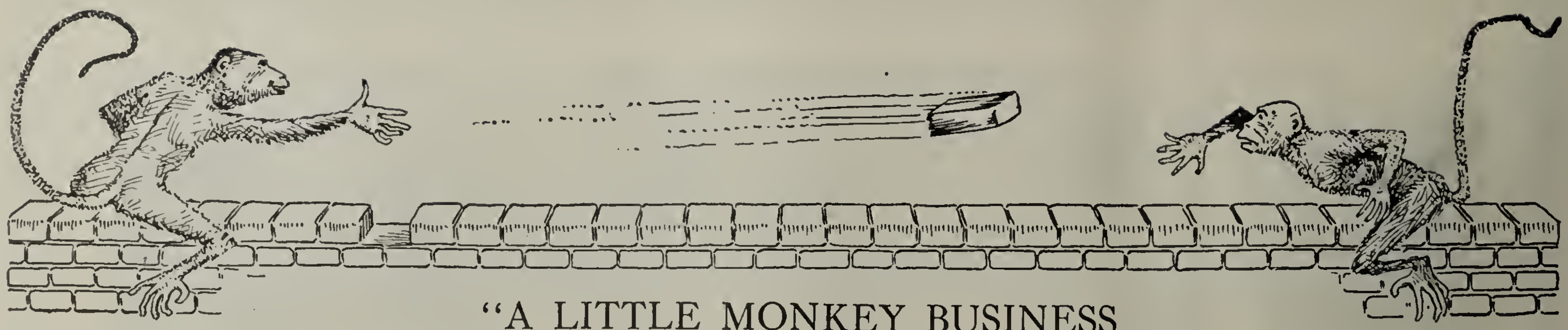
The simplest escape from all these difficulties is to abandon the use of cement filler altogether and use Paving Pitch. *Every joint is then an expansion-joint.* There are no stresses or strains at any point. When the pavement is completed the engineer knows that it will play no tricks on him, but will proceed to give him good service for twenty or thirty years without any further care or expense.

The best paving pitch is Barrett's Paving Pitch. Look for the label on the barrels.

Booklets free on request. Address our nearest office.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis
Cleveland Cincinnati Pittsburgh Detroit Birmingham
Kansas City Minneapolis Nashville
Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING CO., Limited:
Montreal Toronto Winnipeg Vancouver
St. John, N. B. Halifax, N. S. Sydney, N. S.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Wanted a Larger Dose.

"Read the directions on the bottle, Mandy."

"It sez: 'For adults, one teaspoon——' "

"Thunder! That ain't what ails me—what else does it say?" —Boston Transcript.

* * *

And Remove Everything.

"The doctor says he'll remove my appendix for fifteen hundred dollars."

"Oh, George, I'd much rather have a touring car."—Life.

* * *

Cause and Effect.

"Your brother has the earache."

"It serves him right," answered the small boy's sister. "Teacher has told him time and again he ought not to play the piano by ear."—Washington Star.

* * *

How It Happened.

"How did Jones happen to fall downstairs?"

"Why, his wife said, 'Now, Henry, be careful,' and, as he is not the man to be dictated to by any woman, down he went." —Boston Transcript.

* * *

Got His Number.

Pittsburgh man (telephoning to Long Island from New York)—"Ten cents? Why, in Pittsburgh we can telephone to hades for a nickel."

Central—"But this is a long distance call."—Pitt. Panther.

* * *

Evidently Not.

Hubb—"I wonder why they call an ironing machine a mangle."

Batch—"My boy, evidently you have never sent anything to a laundry."—Chaparral.

* * *

A Natural Question.

The teacher was describing the dolphin and its habits.

"And, children," she said impressively, "a single dolphin will have two thousand offspring."

"Goodness!" gasped a little girl in the back row. "And how about married ones?"—Lampoon.

* * *

Bonehead.

"G'wan, nigger, you-all ain't got no sense nohow."

"Ain't got no sense? Whut's dis yere haid for?"

"Dat thing? Dat ain't no haid, nigger; dat's jes' er button on top er yo body ter keep yer backbone from unravelin'."—The Lamb.

* * *

Little of It.

"You have sworn to tell nothing but the truth."

"Nothing but the truth, your honor?"

"Precisely."

"Then, judge, with that limitation upon me I might as well warn you that I'm not going to have much to say."—Detroit Free Press.

A Logical Mind.

A new recruit was on sentry duty for the first time at night, when he saw someone approaching.

"Who comes there?" he challenged sharply.

"The officer of the day," said the other.

"Then," was the sentry's unexpected inquiry, "what are you doing out at night?"

* * *

A Distinct Asset.

Traveling in the mountains a man stopped at a cabin and asked for a drink of water. An old woman brought it to him and after drinking he had quite a talk with her, telling her about some of the wonders he had seen in the outside world. When he finally stopped to take breath the old woman took the pipe out of her mouth and said:

"Stranger, ef I knowed as much as you do, I'd go somewhere an' start a little grocery."

* * *

An Unreasonable Disturber.

A lawyer was trying a case, when a young man created much disturbance by moving about the room, lifting chairs and looking under things.

"Young man," called out the judge, "you are making a great deal of unnecessary noise. What are you about?"

"Your honor," replied the young man, "I have lost my overcoat and am trying to find it."

"Well, young man," said the judge, "people often lose whole suits in here without making all that disturbance."

* * *

The Usual Way.

"Time is precious," said the parson.

"It is, indeed," rejoined the business man, "and I've wasted an awful lot of it."

"By indulging in foolish pleasures, I suppose?" suggested the good man.

"Not exactly," replied the other. "I wasted most of it by being punctual in keeping my appointments with others."—Indianapolis Star.

* * *

A Natural Suggestion.

The pretty girl was eagerly watching the drill at a training camp when a rifle volley crashed out. With a nice, decorous, surprised little scream she shrank back into the arms of the young man standing behind her.

"Oh!" she cried, blushing. "I was frightened by the rifles. I beg your pardon."

"No need," he replied, quickly. "Let's go over there and watch the artillery."

* * *

Enough Said.

"Why do you consider women superior to men in intelligence?"

"A bald-headed man buys his restorer by the bottle, doesn't he?"

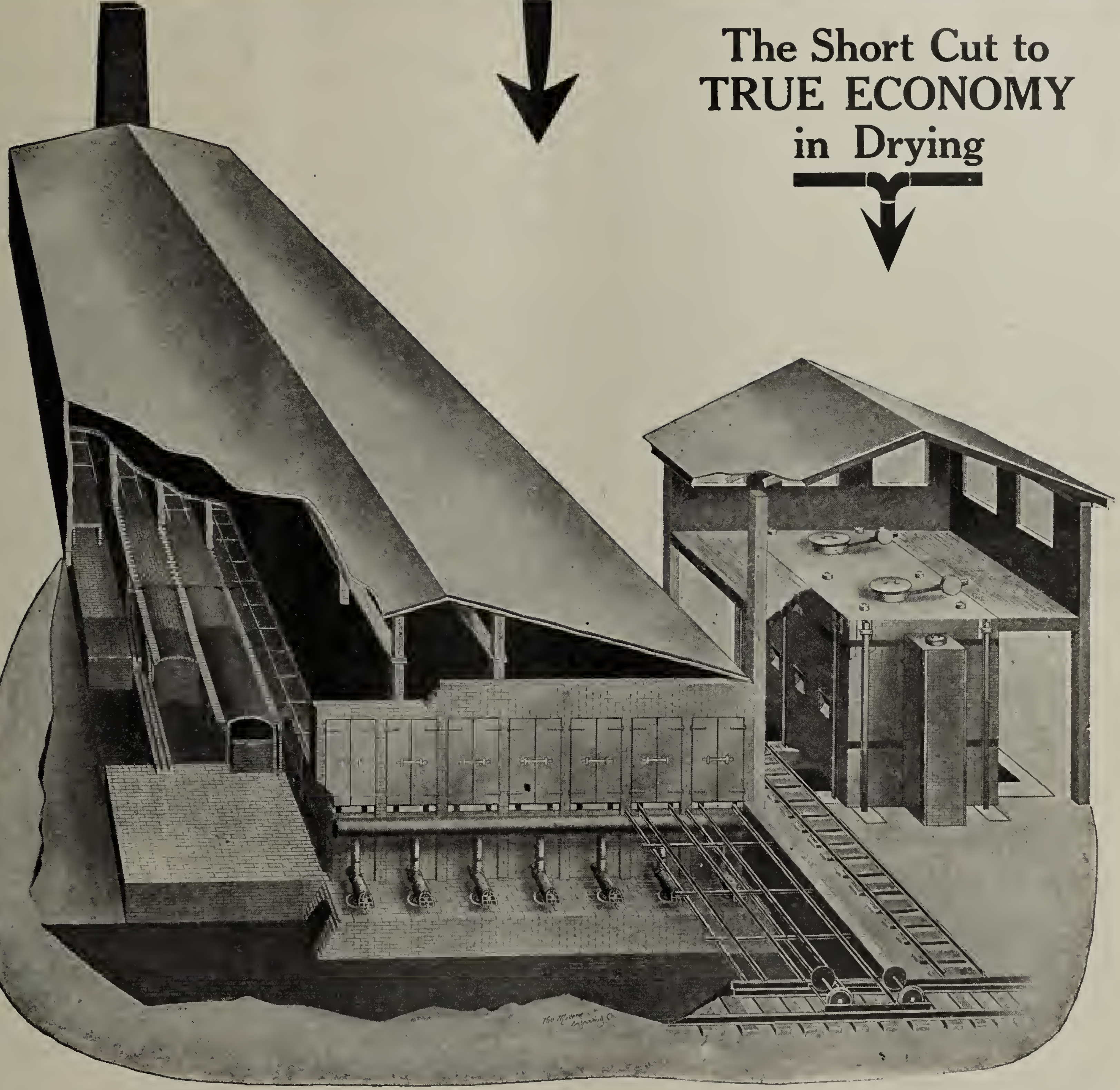
"Er—yes."

"Well, a woman doesn't waste time on a hair restorer; she buys hair."—Tit-Bits.

Why don't you at least investigate the attractive ADVANTAGES of

MECO PRODUCER GAS FIRED DRYER

The Short Cut to
TRUE ECONOMY
in Drying

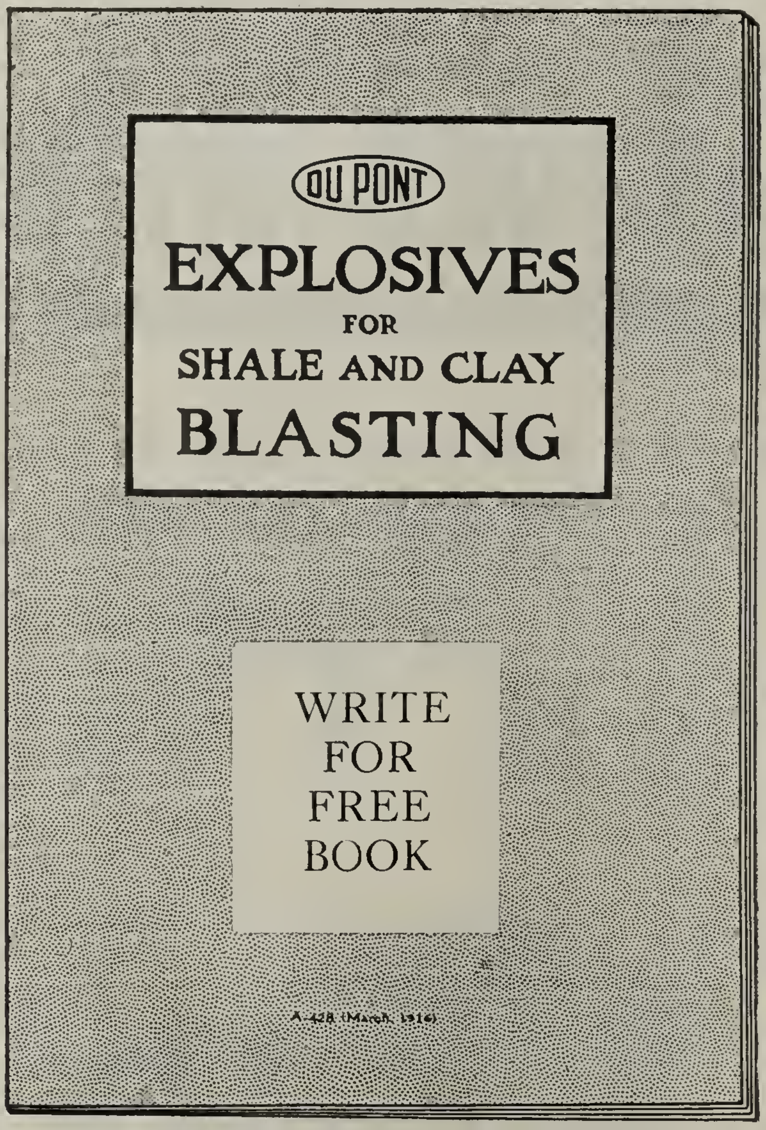


It saves labor, it saves fuel and it possesses a host of other features that cannot help but appeal to you. Its wonderful efficiency comes because of the "MECO" design and this means in addition that the installation cost is not excessive. If you will just tell us that you are interested, there will not be any delay in our getting the details to you.

The Manufacturers Equipment Co.

Dayton, Ohio, U. S. A.

Selling Agent for J. C. Steele & Sons, Statesville, N. C.



DU PONT

EXPLOSIVES
FOR
SHALE AND CLAY
BLASTING

WRITE
FOR
FREE
BOOK

A-428 (March, 1916)

Lower the Cost
of Handling Shale and Clay

The increasing use of clay products calls for adoption of new and better methods for enlarging the pit and handling clay and shale to cause a saving of time and labor and assure an ample supply of material for pug, pan or grinder.

By Using
Red Cross Explosives

to clear stumps and boulders off the surface, improve drainage conditions and loosen the over-burden, the clay and shale stratum is made available for shovelers. Blasting the clay banks lessens the strain on steam shovel, speeds up loading and puts the material into better condition for plant requirements.

Free Booklet Tells How

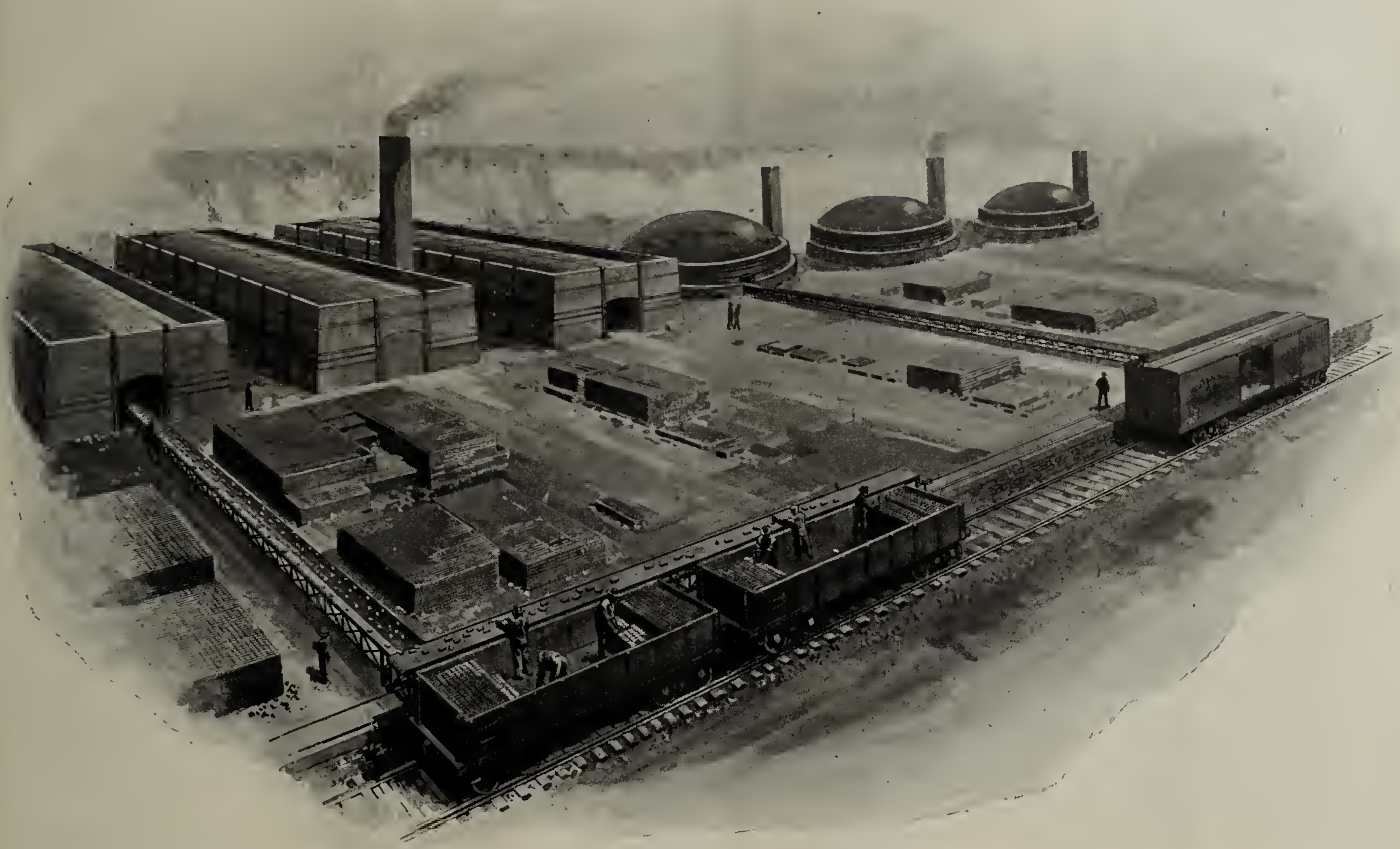
to use Red Cross Explosives for removing clay pit over-burdens and correct methods of placing explosives to loosen clay and shale for quick, cheap and easy handling. Try the new ways to mine clays. Ask for booklet, "Explosives for Shale and Clay Blasting."

E. I. du Pont de Nemours & Co.
Wilmington, Delaware
POWDER MAKERS SINCE 1802

Are You
SAVING YOUR MONEY
to invest in the
NEXT ISSUE
of the
LIBERTY LOAN
?

LEARY
STERLING PORTABLE CONVEYER

"MAN POWER MULTIPLIED"



A modern method of handling brick in the yards—from kiln to car, or into stock shed with a minimum of labor, and a maximum of efficiency.

Electrically operated, with variable speeds to accommodate itself to the number of men employed, it can be mechanically moved from kiln to kiln, as desired.

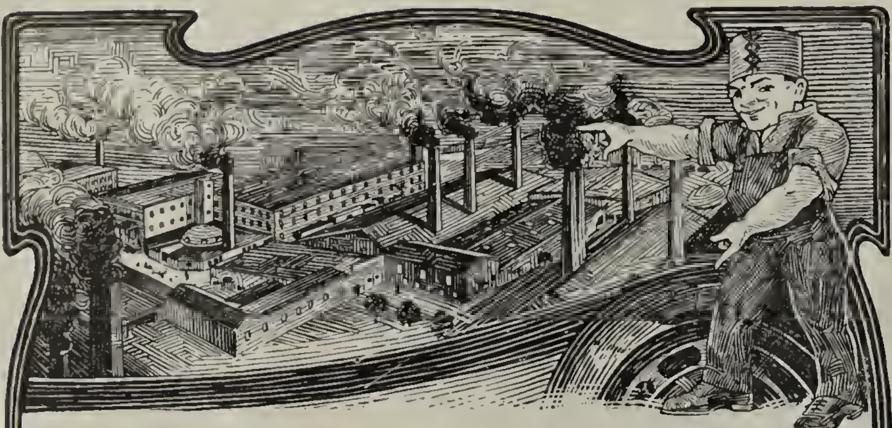
Automatically telescoped or extended as needed. The only successful mechanical substitute for the wheelbarrow.

Made upon specfications to comply with the necessities of your yard.

We shall be pleased to supply you with information and figure with you upon your requirements.

W. J. Leary Manufacturing Company

407-411 Rhode Island St. Buffalo, N. Y.



"On-the-Job" GANDY

The Moving Spirit of Industry

Thirty-seven years' service in the field has made GANDY recognizable everywhere as the "moving spirit of industry."

To the great army of wheels in mills, mines and industrial plants, the command has come to speed up—to increase production—to supply the needs of a world in arms.

Your company of wheels will do the expected and deliver maximum production if "On-the-Job" GANDY—the original stitched cotton duck belt—is in command.

You've only to put GANDY to the test to prove that you've got a belt that gets **all the pull from the pulley.**

The Government has right of way on all transportation lines—traffic conditions can hardly be expected to improve—we advise prompt ordering for present and future needs.

Upon receipt of belting order, look for painted green edge and well-known GANDY trademark.

Request samples and prices—obtainable at mill supply houses or home plant.

The GANDY BELTING CO.
749 West Pratt Street
BALTIMORE, MD., U. S. A.
New York Branch, 36 Warren St.

Written for THE CLAY-WORKER.

BRICK NEWS FROM WASHINGTON AND BALTIMORE.

THE CITY OF LONG DISTANCES" is also a city of marvelous beauty and causes one to wonder if there is anywhere in the old world or new a city of such innumerable parks and wondrous buildings.

The everlasting and eternal conjecture is—why is it not a cosmopolitan city—with all the foreign legations, the incessant and unceasing current of unusual events and the always present dressed up appearance—and now, with various uniformed men seemingly on war business intent.

As one passes the War Building and notices the line of automobiles at the side and many military men coming and going with important looking documents in hand, saluting each other as they pass, one stops to wonder if this is our so-named peaceful country. Alas! for the peace of days gone by. Hurrah for the permanent peace to come from the victory of the near future.

Within a stone's throw of the White House, standing like a beautiful bride, surrounded by cool green foliage and with a real bride's bouquet of spotless white phlox in a straight line in the foreground, we find the office buildings where the ordinary business is transacted, yes, but not the hurried business of other cities. Everything and everybody seems to have time and plenty of it and apparently all, seem to make use of the taxis and public automobiles. That, perhaps, is naturally the outcome of the topography of the city.

The Hydraulic Press Brick Co. is suffering like other brick companies, from lack of men. The cantonment at Annapolis required five thousand workmen, at $3.00 per day. The men eagerly grasped the opportunity, little realizing what expenditure it meant for them in the way of board, etc. To be sure, men must respond to the call, but, of course, again someone suffers, the brick manufacturer particularly. Small speculative work is practically dead, all the business transacted seems to be in large contracts.

The Hydraulic Co. is running to full capacity, however, supplying the New Washington Hotel, two moving picture theaters and one vaudeville theater, a government building and the New Arlington on the site where stood the Arlington Hotel; this is a large operation.

This company suffered an embargo for a time which has now lifted and things are running along much better. The demand is far above the supply, even the demand for cull brick, which were formerly given away, is so great that over 400,000 of these common brick were required by one contractor.

Common brick are bringing from $11.00 to $12.00; red brick, $13.00, light shades, from $20.00 up. Mr. Ralph A. Simpson, the manager, was most gracious and gave information with celerity and interest.

Mr. S. B. Dobbs' office report the largest contract that any brick manufacturer in Washington has had for years, i. e., the Meridian Mansion (apartment house), for which he is supplying face brick to the tune of 800,000.

O. W. Ketcham, from their Washington office, have made the following contracts: New Central high school, 700,000 face brick; Southern Railway Bldg., ornamental terra cotta; Geological Survey Bldg. and Bldg. of the Interior Department, U. S., roofing tile; Georgetown University, U. S. Navy Yard, Norfolk, Va., hollow tile fireproofing.

The Virginia Brick Co. report conditions dull and failed to volunteer any further information.

The Washington Brick & Terra Cotta Co. reports through Mr. John Miller, that they are only doing about one-half the business they should be doing, but he hopes for better trade later in the season.

Mr. Miller failed to mention one large contract of which we were cognizant, so we'll not specify. Common brick and repress brick are their manufacture, also partition tiles.

Baltimore News.

A call for information aimed gently at Mr. Sam'l Klein, of the Champion Brick Co., elicited the following information:

The brick situation in Baltimore, at the present time, is in a very unsatisfactory condition so far as manufacturing is concerned. The shortage of labor and the scarcity of coal has reduced the output about one-third of its usual quantity.

The demand has been quite active, owing to the large number of new manufacturing industries that have located in this vicinity within the past few years. The ordinary building operations, such as dwelling houses have, however, fallen off owing to the increased cost of all building materials.

The general outlook for the future, in the brick line, is problematical in this city. Prices have naturally advanced, but not enough to retard large operations that are now in contemplation, and of which there are quite a number in this immediate neighborhood. MET.

Written for THE CLAY-WORKER.

BRICK NEWS FROM BIRMINGHAM, ALA.

FOR MANY months after the advent of the European war the brick business was at a standstill. For the past several months there has been some revival of trade and considerable building has been done in which brick has been the main factor. As a whole, taking greater Birmingham as a center, building and other uses of brick has been greatly improved. Every iron-making furnace in the district is in operation and they use a goodly amount of both fire and common brick. A large number of new coke ovens have been built within the past few months in which many thousand brick were used. The Avondale Cotton Mill is now building a large new brick warehouse. The Union Cotton Oil Mill is also increasing both office and warehouse facilities.

The Tennessee Company, a subsidiary to the United States Steel Corporation, has plans in hand for building just outside city limits, but close to its big works a large hospital for treatment of all of its employes in case of accidents, and also for the use of families of operators. This building, which will be brick, will cost approximately half million dollars.

The plant of the Southern Sewer Pipe Company, which was destroyed by fire in December, 1915, has been fully rebuilt and an additional large brick building been put up for increased facilities in making double strength vitrified shale, clay and railroad culverts, fire clay and vitrified wall coping.

The Ashby Fire Brick Company after being idle for several months, is being rehabilitated, new machinery, with better and increased facilities added is fast getting into shape to be ready for business. The plant is located some 40 miles from Birmingham. The clay from which the brick are made is high grade, having had the reputation of being one of the best fire clays in the state. It is the intention of the new managers to make only fire brick for awhile, and they expect to have a capacity of four to five million yearly output. Later on the company will enter the tile business. The local office is in Birmingham. Messrs. Tutwiler and Brooks are owners, with Mr. H. M. Brooks as purchasing agent.

M. W. Berry Brick Corporation has incorporated with W. T. Worthing, president and treasurer; W. E. Wilmot, vice-president; M. W. Berry, secretary and manager. Capital stock authorized is $5,000. The company intends to do general manufacturing business in clay products. Headquarters will be established in Birmingham.

Robertson Brick Company, which suffered a loss of several dry kilns some time back, has recuperated from the ill effects of this disaster and is now making brick. Mr. Walter Robertson, long with the company, has left the management entirely in the hands of Mr. A. C. Sharpley. P. A. T.

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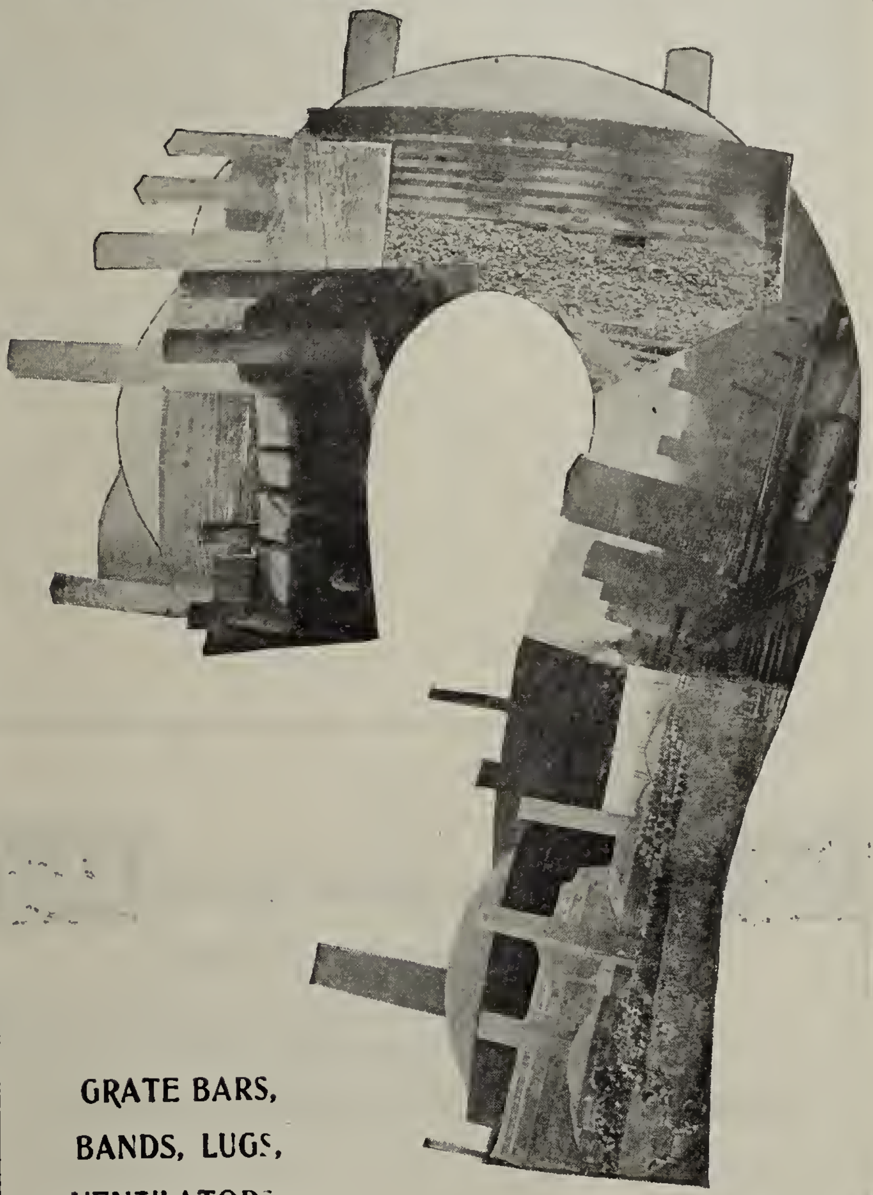

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THE CLAY-WORKER

The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol LXVIII. INDIANAPOLIS, IND., SEPTEMBER, 1917. No. 3

Written for The Clay-Worker.

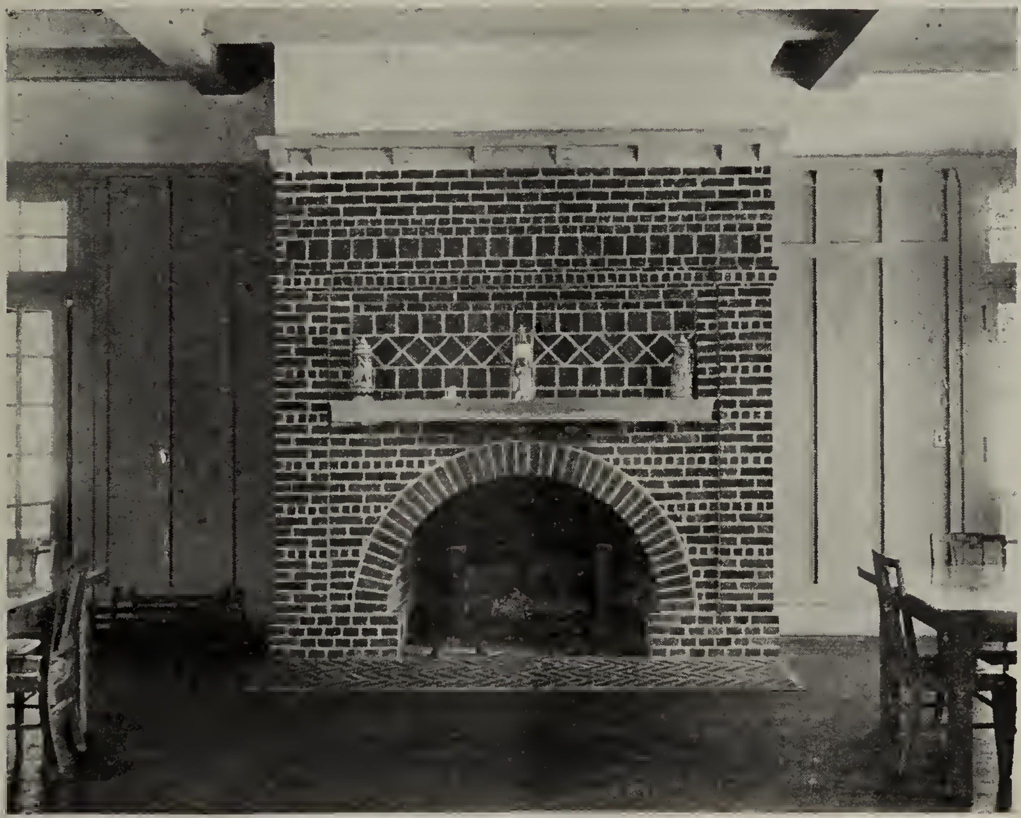
PUTTING ART INTO ARCHITECTURE.

Brick More Than Any Other Building Material Combines the Two Elements, Beauty and Permanency.

NO ONE OTHER AGENCY has contributed more to the putting of art into architecture than burned clay products—brick, tile, and terra cotta. Moreover the burned clay products furnish the two elements of beauty and permanence in the superlative degree. There is nothing so far discovered or produced which is more permanent than properly burned clay, and there is no other building material which in its natural form supplies so wide a range of colors or offers a greater variety of products with which to carry out architectural designs. Indeed there are so many possibilities to the art side of clay products that we are discovering and developing new things and new ideas right along year after year notwithstanding that the clay-working industry is one of the oldest industries in the world and has had the attention of more generations of people in its development than any other industry. There is really no limit to the possibilities for beauty and beautifying with clay products in connection with all phases of architecture, whether it be the architecture of the home, the public building, for the landscape or garden, clubhouse or hotel.

We have scattered here and there throughout this great country of ours many clayworking institutions conspicuous for the magnitude of the industry, the varying of products and the ingenuity in developing new ideas for putting art into architecture. Any one of many of these will furnish an almost inexhaustible theme for writing or discourse upon the beauty and artistic possibilities of brick, tile and terra cotta for almost every structural use imaginable. Indeed it is not possible to do justice to the output of any one of many such clay-working industries in any single article of this kind. All we can do is select some particular industry and treat briefly of its development and touch a few of the interesting uses of its product.

In the present instance we have selected a southern industry, that of the B. Mifflin Hood Brick Co., Atlanta, Ga., which has attained to considerable distinction with some of its specialties, including "pottry," tile and face brick. In addition to a full line of brick this concern manufactures tile in various shapes and sizes from 1x1x1 to 12x12x2 and includes in the varieties what is known as nosed tile for treads of stairways. They seek diligently in pushing their product to combine the use of the brick and their tile, because when an architect or a builder is using their product throughout the house a better opportunity is furnished for getting the best and most harmonious effects. Even in stucco buildings, they are able to add a decorative feature because the tile shapes used as inserts will break up the monotony of stucco surfaces and add beauty to their effect. They say they have been able to get some splendid results in this way which are very pleasing to architects who have used their tile shapes in connection with stucco walls.



"Pottry" Fireplace, Design No. 43, of the B. Mifflin Hood Brick Co., Atlanta, Ga.

To the on-looker it really seems that there is very little excuse for turning away from products of this company to any other material in building operations, because they have a varied line in all their products which give the masons a wide radius of activity. They have a great wealth of colors in their products secured by the use of high grade shale and a liberal use of grog of the old waste scrap whiskey jugs. With this latter material they have developed a product very rich in texture and with a wealth of color. Indeed this is one of the features of their line of floor tile, landscape and terrace tile and in the get-up of their artistic fireplaces.

The B. Mifflin Hood Brick Co. is strong on fire places. It has gotten up some of the finest designs to be found anywhere in the country and a study of the reproduction of some of this work in their artistic catalog is enough to give one a strong impression of the home element and the important factor the fire place plays in supplying this. These fire places give some idea of the great range of possibilities in variation of design and different combinations of tile and brick in putting art into fire place architecture.

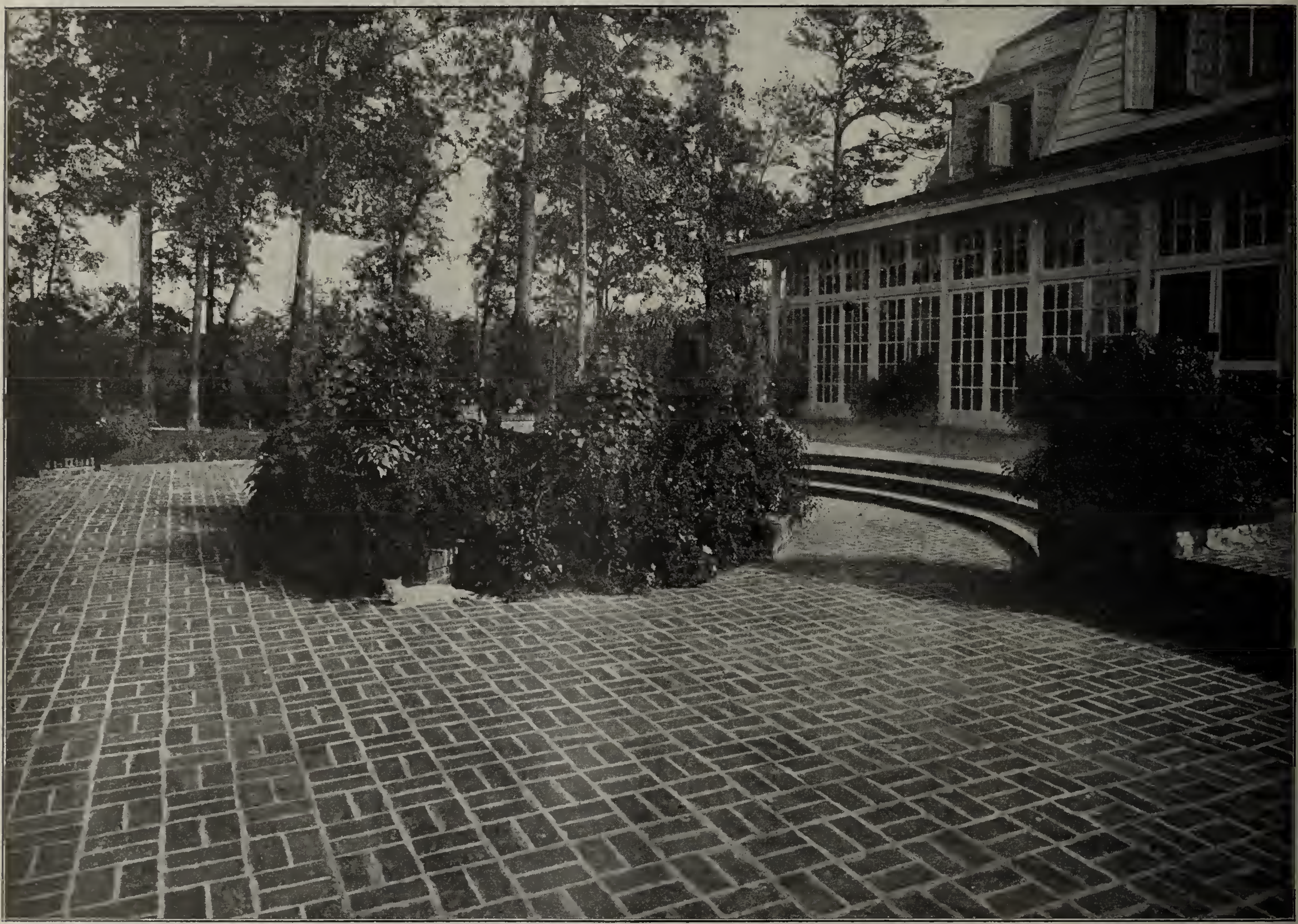
But, while they are strong on fire places, and while one could dwell at great length on the beauty of the designs suggested by them and actually constructed, the thing which seems more interesting and important for discussion in an article of this kind because of the necessity for awakening wider interest is in the fact that the fire place is not the end but simply the beginning, so to speak, of the use of tile, and they are developing it in other lines for outside work and for landscape architecture.

One of the things The Clay-Worker has plead for repeatedly is more attention to extending the use of floor tile that it may become a familiar product on porches, walks, in homes as well as in hotels and public buildings. The Hood people have had this broader vision for some time and have been doing some excellent work that should prove a shining example for the encouragement of other clayworkers in other parts of the country.

Perhaps in a way they have been fortunate in their surroundings for they claim that no section of America has more possibilities for landscape work than is offered in the south. The spirit of colonial architecture which pervades the whole south country naturally invites some of the artistic treatment that can be given with brick and tile in outside work.

What is said to be the most interesting rubble random brick and tile work in the United States is the terraces, driveways and walks of the Grove Park Inn, at Asheville, N. C. These are laid in the Hood tile two inches thick on a concrete bed and there are miles of walks of broken pieces of their pottery tile laid in rubble random patterns giving it a wealth of color in appropriate design with the rough rock construction work in the Grove Park Inn proper. Only those who have had the pleasure of a trip to Grove Park Inn and have seen the work can fully appreciate its beauty as the harmony of tile and brick work is perfect with that of the rough rock construction.

This is but one of several examples which might be cited to show some interesting development along the line of effort that has become something of a hobby with the clayworker.



Approach to Druid Hills Golf Club Terrace, Atlanta, Paved with Hood's Brick Shape "Pottry" Tile.

There is a splendid field for work in fire places and in interior decoration, but the biggest and broadest field in the future is in beautifying the outside surroundings with a combination of tile and brick in which we hope to see clay products not only conspicuous in porch construction but spread all about over house, lawns and garden, entering as prominent factors in the landscape architecture itself.

There is much can be said of the utility of burned clay tile for porch and promenade floors, for steps and stairway facings, but after all perhaps the important appeal will be found in the beauty possibilities. It is the beautifying, the putting of art into architecture, that after all makes the strongest appeal. Fortunately in clay products, as stated at the out-set, we have not only an element of beauty, of great and varying possibilities, but there goes with it the element of permanence which makes it all worth while.

Hood's "Pottry" Fireplace Design No. 38.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

THE BUILDING SITUATION along the Pacific Coast, in so far as the reports of the building departments of the leading cities can be taken as a criterion, showed some improvements for the month of August as compared with the same month of last year. San Francisco's building permits totaled $1,217,691 against $993,020 for August of last year. Of this amount a fair proportion represents brick construction. Deliveries on work already under way continue heavy, and the prospects are bright for future activity in this kind of building, according to the local brick manufacturers and dealers. The apparent holding off on the part of investors in going ahead with contemplated large new buildings and similar projects caused some little uneasiness during the summer, but there is no longer ground for apprehension on this score, as a number of contracts have been signed in the last fortnight requiring a great many bricks and figures are being taken on other jobs that call for even larger amounts.

Hood's "Pottry" Brick and Tile Fireplace, No. 21.

While some of the coast cities showed a falling off in building operations in August as against August of 1916, others showed decided gains, which more than offset the drops. San Diego and Sacramento showed the greatest proportionate gains. The permits for the former city were $116,429 in comparison with $71,673 last year, and for the latter city, $352,228 in comparison with $252,630. Los Angeles, Oakland, Portland and Seattle showed declines, but in the case of Oakland, the value of the permits was greater than for the preceding month of this year.

According to W. W. Dennis, manager of the McNear Brick Agency, the high cost of production is the only cloud in the sky so far as the local brick industry is concerned. The demand is active and lots of new work is in sight for the immediate future, but the high price of coal and raw materials is a matter for serious consideration, which he predicts will lead to higher prices for the finished product within a short time unless costs can be reduced. Labor, he says, is scarce at the brick plants in this vicinity, which has a tendency to curtail the output more or less in some instances.

In regard to the car situation, W. H. Edwards, manager of the Brick Manufacturers' Association, which includes in its membership practically all the yards within 250 miles of San Francisco, the members so far have not experienced any great difficulty in securing enough cars to handle their products expeditiously.

The fate of Camp Fremont, the army cantonment near Palo Alto, down the peninsula from San Francisco, is a matter of considerable interest to the sewer pipe manufacturers in this vicinity, as well as other local industries. There have been various reports circulated within the last few weeks regarding the abandonment of the camp. The high cost of the proposed sewer system is one of the grounds of contention, it is understood. Advices received by the local Chamber of Commerce from its Washington representative, state that the camp is to be completed and occupied just as soon as sufficient troops are available to make this consistent with the plans of the War Department.

Upon investigation of the machinery market, N. Clark & Sons find that it will be impossible for them to rebuild their plant in Alameda, Cal., which was destroyed by fire last month, as rapidly as they had hoped, so they will not be in position to fill orders for sewer pipe for some time to come. The architectural terra cotta department is operating as usual, however, and business is reported well up to expectations by Mr. Gwynn.

Considerable street work is being done in San Francisco and a fair proportion of the contracts call for a strip of vitrified brick pavement, which makes the city a heavy purchaser of paving brick at the present time.

Operations have been resumed at the Livermore Fire Brick Works in Livermore, Cal., after a shutdown of the plant for two weeks, during which time a larger dryer was installed and other improvements made.

A new brick plant has been placed in operation in Modesto, Cal., by the Union Brick & Tile Company. The first week's output consisted of 150,000 bricks.

Activity in mining for magnesite is shown in steps taken by the Gustine Magnesite Company of Oakland, Cal., which has mines in Stanillaus county. This company has secured a permit from the State Commissioner of Corporations to issue stock in exchange for a lease to operate certain mining claims.

The San Francisco Chamber of Commerce has received a communication from the Murley-Mason Company of Seattle, Wash., stating its desire of getting in touch with firms manufacturing fire brick.

A considerable amount of architectural terra cotta from the factory of Gladding, McBean & Co., in Lincoln, Cal., is being used in the construction of the new $250,000 Yolo county court house nearing completion at Woodland. The supervisors of Yolo county had at first contemplated the use of stone for the exterior of their monumental building, but on the suggestion of their architect, made an exhaustive examination of the use of terra cotta in similar structures and decided in its favor. The four full-size figures, representing Law, Authority, Justice and Mercy over the central bay of the main front of the building have already attracted much attention. These figures were executed by Pio Tognelli, a Florentine sculptor, now with Gladding, McBean & Co.

A new company has been organized to take over the old Cary brick plant on the southern waterfront of Richmond, Cal., which is a rapidly growing industrial city on the east side of San Francisco Bay, where the Standard Oil and other large corporations operate extensive plants. The new firm has been incorporated under the name of the Allied Unions Brick Company, Inc. The capital stock is $5,000 and the principal stockholders are J. B. Cann, president, and E. E. Dooley, secretary and manager, both of Oakland. While the works and yard will be in Richmond, the main office will be in Oakland. A crew of men has been at work for about two weeks getting the place in readiness for the installation of new and up-to-date machinery, preparatory to starting operations with a comparatively large force of men. It is the intention to manufacture tile as well as brick.

Preliminary steps have been taken for the incorporation of company to be known as the Terra Cotta Products Company,

Elks' Club, Columbus, Ohio. Hood's "Pottry" Tile Used on Walks, Terraces, Fireplaces and Garden Court.

to take over the business of M. T. Mapel at Toland's Landing, near Rio Vista, Cal., operated for the past four years under the name of the Terra Cotta Lumber Company. During that time Mr. Mapel has built up a large demand for brick, tile, etc., and has decided that the growing business justifies the organization of a new company with a view to installing new equipment and increasing the output of the plant.

The Heyburn Brick & Tile Company, of Heyburn, Ida., has opened a branch plant in Burley, Ida.

F. S. Shoesmith has sold his stock in the Moscow Fire Brick & Clay Products Company of Moscow, Ida., to John Nisbet, and the latter has resold an undivided four-fifths interest in the business to A. S. Lyon, Thomas Hall, Warren Truitt and H. B. Mickey. Mr. Mickey has been elected president of the company and Mr. Lyon vice-president.

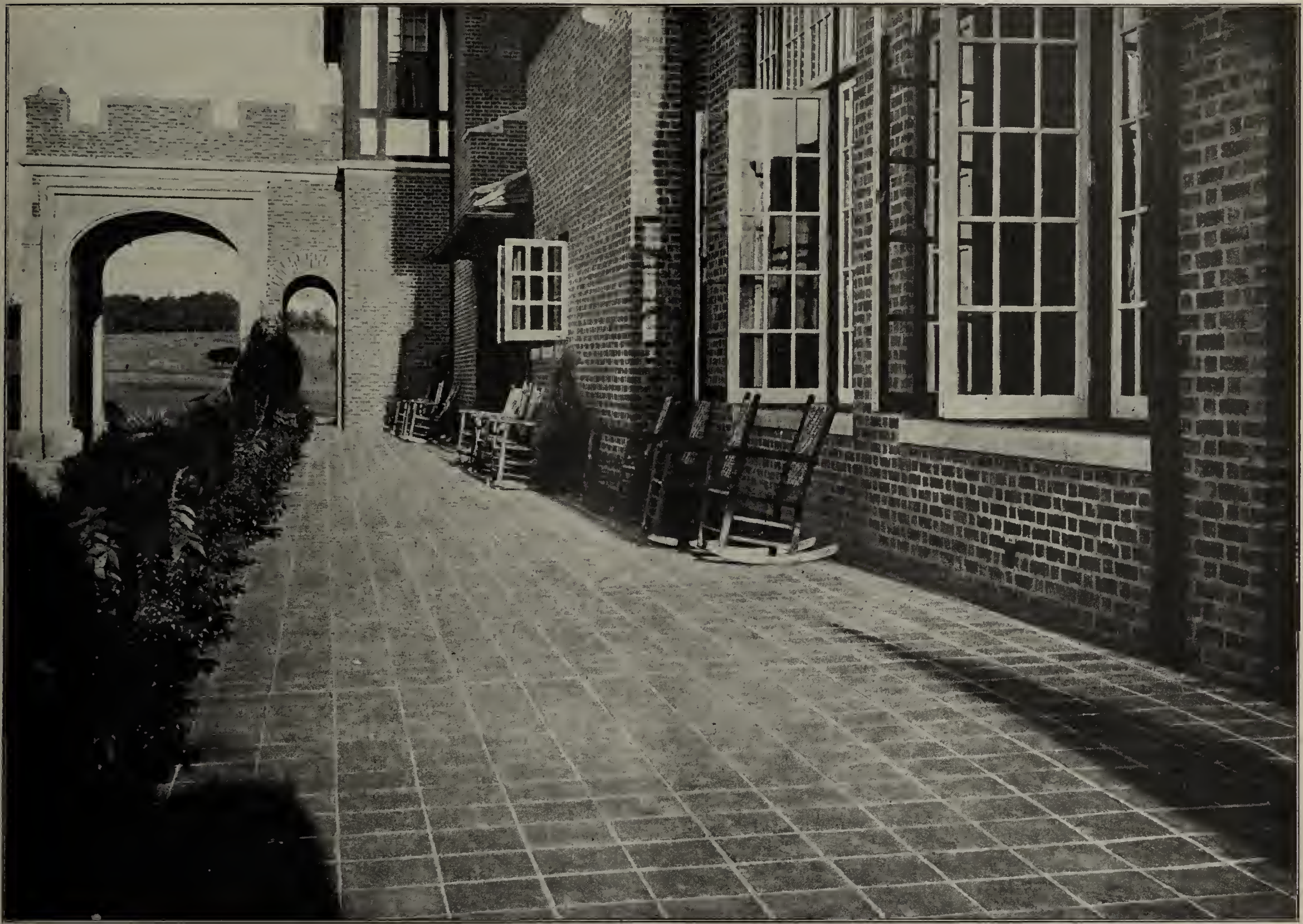
San Francisco, Sept. 5. SUNSET.

CUTTING DOWN FREIGHT.

The appeal for conservation in freight has now reached the point where it not only means making a study of your territory so as to supply the trade near you instead of that near some competitor to save freight, but it also takes into consideration the item of coal used in burning brick and in the power plant.

Those in charge of the coal end of the food control business in connection with setting the maximum price on coal at the mines also made the suggestion that to save freight and facilitate transportation every consumer use coal from the mine or the mine field nearest to him. This in many cases will mean cutting out some favorite coal and taking another grade not so desirable. After all, however, it is more a matter of personal preference than of real difference, because coal values are pretty well established in their ratio to coal prices, and it is more a matter of detail in arranging to handle and burn the coal than anything else beside the personal preference.

There are some conditions where certain grades of coal are essential and certain other grades prove injurious, but even considering these a proper effort at co-operation between the clayworking fraternity and the coal committee in this matter will help considerably in wrestling with the railway haul and cutting down the freight item in connection with coal. From present indications, too, we are going to need every little help of this kind to prevent congestion and delay in transportation. So think the matter over and help out in this to the best of your ability both by striving to serve your near-by territory in your own products and looking to the nearest field for your coal supply.



Atlanta Athletic Club House at East Lake. A Happy Combination of Hood's Southern Harvard Brick and "Pottry" Tile, Made by the B. Mifflin Hood Brick Company, Atlanta

It goes without saying that German classes will not be popular in our schools this year.

Written for The Clay-Worker.

BUTTON-HOLE TALKS.

"CLOTHES DO MAKE a difference in a man, Gates, I don't care what anyone says to the contrary. They affect the outside appearance, and they affect him internally. Last week I had to take an unexpected trip, had to start hurriedly. It occurred to me that the suit of clothes I was wearing were not quite the proper thing, and, as there was no time to get a suit made, it was up to me to hustle over to the ready-made shop and get a new suit. They fitted me out and I was proud as I went out on the street. Everyone that looked at me was, I thought, admiring my clothes. Really, I said to myself, there is no call for a man going wasting money on a tailor when he can get such clothes as these ready-made. I don't know when I have been prouder or more satisfied with a bargain and I just wanted people to look at me and admire."

W. D. Gates.

"Comfortably settled in the smoking compartment of the Pullman in the evening, speeding on the night's run, I got to talking with a very prosperous and intelligent traveller, and somehow, the conversation got on the subject of proper clothing. After quite a general discussion, and full of pride at my new purchase, I remarked to him that I saw no use paying a high price to a tailor for a suit to order when such good suits could be bought for so much less ready-made, adding, as I stood up that he might the better take it in, that I didn't mind telling him that this suit I had on was a ready-made suit."

"Just glancing over at me he said, 'Good Lord, man, you don't have to tell anyone that, the suit itself speaks loud enough, it just yells it at the public.' Then he deliberately proceeded to show me fifty-seven different things about it that told the story. When he had finished, and indeed long before he had finished, my pride and self-satisfaction were all gone. The suit was the same I had been so proud of, that I thought fitted me so well until he took it up, but it no longer was any good to me. If anyone looked at me after that I curled up and dodged. Whereas before I had swelled out with pride, thinking they were admiring, now I winced knowing they were taking my measure as a cheap skate. Until I ran into him I was a satisfied man. I was satisfied and content with what I had. This condition he changed absolutely. Never again could I take comfort with that suit of clothes.

"Anyway clothes, while intended, as to their material, to protect you and keep you comfortable and incidentally to shield your personal charms from the public gaze, still are only good while you are satisfied and content with them. If you don't like them and feel out of place in them you might just as comfortably wrap your form in a blanket and be done with it. You couldn't be comfortable at an evening banquet attired in an outing suit and you would not be happy going fishing in full dress. The punishment must fit the crime. No, not for me any more is that suit. I am no haughty aristocrat and I had an idea that I was above caring or worrying about dress, but that man finished me as far as that suit concerned. I have picked out my tailor and it's up to him from now on. It's his business to keep posted and he will have all responsibility as far as I am concerned. I have given the suit to a tramp and to a tramp that it won't fit as well as it did me. Seems to me clothes have only brought trouble anyway since the first fig leaf incident."

GATES.

Every once in a while we get tired of hearing people say that to do business with certain foreign countries we must depart entirely from American business methods. There is always room to improve our business methods with a view to smoothing the way to a better and bigger business, but somehow the idea of departing from them entirely and copying the ways of older countries sounds too un-American and like a step backward instead of forward. Let us be world leaders and not followers.

REDUCING THE FIRE WASTE.

THE MOST EFFICIENT MANNER OF DOING SO IS TO BUILD WITH BRICK.

ADMITTEDLY QUITE A PERCENTAGE of our annual fire waste is preventable. Proper precautions and the exercise of due care and diligence will serve to materially reduce the annual fire loss. This is a service that the country is being appealed to to make because there is a special need to conserve all our materials and energy to wage a successful war.

The clayworking industry has been a consistent advocate of fire precaution right along, and has sought to co-operate with various agencies interested in propaganda to prevent fire, partly because of a natural spirit of conservation, and partly because the clayworking industry benefits through efforts of this kind. The product of the clay working industry is the best fire proofing material in the world and if the people will use more brick and other clay products in building and in safeguarding with brick walls in various ways the fire loss of the country can be materially and permanently reduced.

This phase of the matter all clayworkers are fairly familiar with, that is safety against fire that may be obtained through brick construction, so there is no special call to go into it in great detail right now. But rather the intention is to take up some incidental phases of the situation as brought out by recent precautionary notices and illustrations coming to hand under the approval of the National Board of Fire Underwriters and indorsed by the Council of National Defense. This has to do with fire prevention through every-day precautions, and prompt attention to putting out fires when they are once started.

Taking the illustrated warnings as they come in this appeal of patriotic duty in preventing fire, we find three men pictured looking at some factory rules. Nearly every well-organized factory has a set of rules and included in them should be some terse instructions or rules pertaining to fire prevention and putting out fires when they once start. See that such rules are up in your plant and that the men employed understand them.

"Don't Smoke," is the next precaution, which is meant to apply not as a general injunction against smoking, but against smoking where smoking should not be done. The Department of War has given us some object lessons in connection with this rule in building our army camps. They have enforced very strictly rules against smoking anywhere in the camp grounds during construction and many a workman has been discharged and fired from the grounds for persisting in smoking against rules. The army officers encourage the soldier boys to smoke pipes, but during the building of the camps and around places where smoking adds to the fire danger it has been prohibited, and the rule has been stringently enforced. This is a splendid rule to apply in factories and warehouses because a little carelessness in connection with smoking may cause severe fire loss.

The picture of suspicious persons who should be reported naturally turns thought toward spies and incendiaries, but there are really other dangerous people who should come under suspicion. There is a case in mind right now of a recent fire in a teaming company barn that burned up sixty head of mules and caused a loss of $40,000. The fire occurred on Sunday afternoon and the only suspicious circumstance

A Patriotic Duty of Every American is to

PREVENT FIRE

Learn the Rules

Don't Smoke

Report Suspicious Strangers

Clean Up at Home

America at war needs every ounce of her energy and resources. It is criminal to cause hazards; it is unpatriotic to neglect them.

Here are some of the ways in which you can help:

1. Learn the factory rules and observe them.
2. If you discover a fire, give the alarm promptly. Do you know how to do this. Ask to be shown.
3. **Don't smoke** where it is not permitted.
4. Never drop a lighted match, cigar or cigarette; be sure that it has no spark left before throwing it away.
5. Report suspicious strangers seen about the plant.
6. If you notice any unusual smoke, the overheating of any machine, or any other accident, notify the foreman at once.
7. Carry your precautions into your own home; keep your house and yard free from rubbish, and help others to do the same.

Where would **your** job be if this plant should burn?

Send Alarms Promptly

Extinguish Matches

Report Smoke or Accidents

Factory Burned—Job Gone

Help Uncle Sam

BE CAREFUL

Approved by the National Board of Fire Underwriters
Endorsed by the Council of National Defense

surrounding it was the fact that a bunch of darkies had been shooting craps and smoking cigarettes on the shady side of the barn. So one may well consider as suspicious bunches of boys or idle men who are whiling away the time or playing games and smoking alongside of buildings liable to be damaged by fire.

Another picture in the group which shows a man with a wheelbarrow cleaning up trash around the house reminds us that in the fall of the year we should have a clean-up, paint-up campaign as well as in the spring, because many fires start in accumulated piles of combustible trash. A match with some fire remaining on it is carelessly dropped, a spark from a smokestack or some other source settles in a pile of trash, smoulders along slowly for an indefinite period and then breaks out into a ravage of fire. So there should be a clean-up and then a practicing of the habit of being careful about throwing down matches when there is still fire upon them. Another thing in connection with cleaning up and painting up is that all rags and waste used in this work should be destroyed. About the most prolific source of spontaneous fire is rubbing rags and cleaning rags used in painting and polishing. These thrown carelessly to one side, in a closet, barrel or box have caused more mysterious fires than any other one agency. So watch after them carefully and see that they are properly burned up in the furnace or somewhere else.

Then, finally, it is a good thing to figure on and have a definite understanding of what you should do in case fire did break out around your place. Fire is a form of accident and every well regulated institution should have some rules before of what should be done in case of accident. In the matter of fire there should not only be means for sounding alarms but there should be a definite understanding of how to use them to get prompt action. Also there should be a knowledge and understanding of the facilities for fighting fire and how to get them into action without loss of time when a fire starts. Most disastrous fires if gotten at early enough could have been stopped with a few buckets of water. So when a fire does break out, all authorities agree that qick and decisive action of the right kind early is the most important thing. Minutes and seconds count big when a fire is starting, and good precautionary training and understanding of what to do and how to do it quickly is the most important essential in reducing the annual waste through fire loss.

PLANT MANAGEMENT

By Richard B. Hoehne.

Part VII.

FURTHER REVIEW of my practice brings to light more instances, where the adherence to old-fashioned methods has had ruinous effect upon the pocketbook. Sometimes the faulty system is continued even with full recognition of its deficiency, simply because alterations and improvements represent additional work and worry in plant management, hence is it deemed best to postpone them? Permit me to quote a little episode typifying this sort of management.

The Nasty Clay Wheelers.

Some time ago, on a fairly hot summer day, I happened to venture into a brickmaking plant, just to see "how't was done." The superintendent being a good-natured sort of a fellow, took me under his personal guidance and showed me around. explaining the plant and his favorite ways of doing things with the necessary comment, that it had to be done just so and so and that other methods might be appreciable on another plant, though not on his. Then came the usual conversation about the efficiency being exercised, which impressed me so that I regretted ever to see this theme nearing completion, as I naturally expected it to end with the citation of the rich dividends the stockholders of that company were regularly getting, and which I estimated to run somewheres between forty and fifty per cent. annually. But, how I was surprised when all reference to this particular point was avoided. My character not permitting inquisitiveness to such a degree, this put me in a bad fix for a few moments, for curiosity was getting the best of me. He was already delivering the preface for the next topic concerning the different panels that could be assorted from the various brick made, while my mind was still occupied in stipulating a refined way of getting a little information on the subject of profitableness. There—a sudden relief.—A half-sized boy came shouting as he advanced: "We're out o' clay again,—hey, mister! out of clay!"

The superintendent at once excused himself with well-selected words, which I could have easily interpreted as meaning that he expected to find me again in a few minutes at the very spot he left me, not realizing that I thought this to be entirely impractical on my part. In the first place, I knew what sized minutes it ordinarily takes to adjust a complaint like I had heard the boy making, and secondly my ambition could not possibly be satisfied without obtaining some knowledge about the dividends. Consequently I strolled away in some unknown direction until I found one of the men working there. To pretend that I was not merely loafing about, I questioned him whether the company had any old iron, and where it was at. Answering my question he put me on the road to where I could see "lots of it," and after a short walk I was confronted with a scrap pile seldom equalled in size nor in quality. The fact that I was all left to myself gave me an opportunity to make a pretty fair survey of the scrap-pile and in fifteen or twenty minutes I was bound for the spot again, from where I had taken the guidance into my own hands. On the way back I could feel my mind settling down on the dividend question, while the superintendent arriving at the same time re-opened the conversation with an unprintable remark about "nasty clay wheelers." His further statements enlightened me that the clay wheelers had been bothered by the hot weather, like everybody else, and that they threatened to quit their job unless a substantial increase in wages would justify their further toiling. He did not consider the wheelers' demand entirely unreasonable, save that it would cause the rest of his crew to copy that style and make similar demands, which he thought would put the plant on the "bum." In concluding his lengthy reference to that subject he turned to me, asking: "Now what can you do with a case like this?" Notwithstanding the precarious problem with which he thought himself face to face, that concluding sentence seemed to be put forth rather as a mere phrase of conversation, than as a quest for advice; yet, I thought I must snatch the opportunity. With this in view I gave up the listening attitude which I had maintained during his explanation, and told him that in my opinion the solution of his problem appeared to be one of the simplest things on earth.

"Well! Why! How, etc.!" "Well, were I in your position the whole affair would be settled for good by next Monday morning. (This conversation took place on a Friday afternoon.) I would proceed as follows: First, I would fire the clay wheelers and tell them never to come around again; secondly, I would pick the necessary machinery from the scrap-pile to install a clay conveyor, which, attended by one boy, would replace the four men who have been wheeling the clay to the crusher. "Conveyor?—Scrap-pile—Crusher—Oh, yes! Let's see where John is at," he said. After a long hunt, John ultimately was discovered in a rather menial position, namely, underneath the clay crusher. One of the spur-gears had suddenly lost several teeth, just like anybody might at an extremely old age, and John had posted himself there with the crowbar to jerk the big gear every time the pinion would encounter the teethless section of its partner. That way John managed to keep the crusher going. On the superintendent's order, however, he turned his job over to an able substitute, and accompanied us to the scrap-pile. Seemingly, John was somewhat acquainted with it, while the superintendent soon confessed his surprise at the fact that I was more familiar with his scrap-pile, than he. I pointed out the machinery that would make a splendid clay-conveyor for him, when John butted in: "Didn't' ye know that stuff was laying there since the plant was built?—and this is the gear for the crusher, it came along as a reserve piece, because the gear that was on, showed considerable wear already when we got the crusher two years ago."

For the reader's information it is deemed necessary to insert here that the plant spoken of had been erected four years prior to my visit. The man in charge of the construction had died soon after starting the operation of the plant, which thus went into the hands of the present superintendent. The erector had fully recognized the necessity of installing the clay-conveyor previously mentioned, and for this reason had it ordered together with the other machinery, with a view of using it as soon as necessary and as soon as the clay bank would permit its installation. By neglecting this, the company had been put to an unnecessary expenditure in form of wages, for a period of at least three years. Calculating a year at 300 working days, and the wages for each man at $2.25, then the total amount spent for wheeling of clay is:

$$3 \times 300 \times 4 \times 2.25 = \$8,100.00$$

Therefrom has to be subtracted the would-be operating expense of the conveyor, which shall be figured at $1.75 per day, including $1.50 wages for the boy feeding it. Thus:

$$3 \times 300 \times 1.75 = \$1,575.00$$

Consequently the negligence in plant management in this case resulted in a total loss of

$$8100 \div 1575 = \$6,525.00$$

Inasmuch as my purpose of visiting the plant had been none other but to see "how they did it," I thought it timely to announce my departure. The superintendent, accompanying me for some distance, thanked me for the call and voiced his wonders that he had forgotten all about the clay-conveyor, which he admitted to have been informed of at the time he started in. "And I knew we weren't doing the right thing." "There comes our president. I'll make you acquainted with him, he's a very pleasant gentleman." Having been introduced as some kind of a brickmaker, I was at once asked by the gentleman, what I thought of his plant; for his part, he estimated it to be the finest little plant in America. I replied that I agreed with him on that point, that I thought, however, it would have to be given some attention, otherwise it were my opinion that no dividend could be expected from it neither now nor in the future.

(To be continued.)

MESSING UP THE LAW.

Georgie had a small dog and was summoned before a magistrate because the dog had no license. Georgie claimed it was a pup. But evidence was called and Georgie was fined and told he must get a license or give up the dog. When Georgie came home he told his father about it.

"I don't understand it, dad. They had me up last year and the year before, and each time I said the same thing and they let me and Bim off. Now they fine me. I think somebody has been fooling with the law."

Written for The Clay-Worker.

EXPERIMENTAL STATION FOR CERAMIC INDUSTRY TO BE ESTABLISHED AT COLUMBUS, O.

R. T. Stull Selected as Head of This Department.

SECRETARY OF THE INTERIOR LANE authorized recently the establishment of a mining experiment station at Columbus, Ohio, under the jurisdiction of the Bureau of Mines, the station to represent the ceramic industry of the United States. Columbus was selected as the site for the station because it is the capital of the state recognized as the center of the clayworking and allied industries and also because the bureau can work in co-operation with the School of Ceramics at Ohio State University and also gain the expert advice of Prof. Edward Orton and Prof. Arthur S. Watts, noted authorities of the subject of ceramics who are connected with that school.

Director Van H. Manning of the Bureau of Mines in recommending that the subject of ceramics be taken up at this station said: "No industry in this country offers more opportunity for constructive effort and new development than does the ceramic industry. Moreover, the clayworking and allied industries represent one-third of all capital invested in crude mineral industries and are, therefore, entitled to the same consideration as other industries now under study by the government. However, the industry is unprogressive, largely on account of technical knowledge. The European research, upon which the progress of the industry has largely depended, is not now available. In addition, this information is not always applicable to American processes and materials. In the clayworking industries, as in many other mineral industries, the utilization of low grade materials is now imperative in order to prevent exhaustion of those high grade materials, which, if exhausted, would leave us at the mercy of foreign countries.

R. T. Stull, Columbus, Ohio.

"In the ceramic industry the fuel consumed represents approximately 20 per cent. of the value of the wares produced, and as a rule a great deal of this fuel is unnecessarily wasted. Hence, the value of the fuel wasted is very large, and the lessening of this waste demands immediate study. Moreover, the manufacturing wastes, due to faulty methods or practice, is very great and at the present time there is no means of subsequently recovering this waste. It is believed that enormous savings can be effected in the clay working industry, but the subject has never been adequately studied, because the necessary outlay has been considered too great for individual firms to make.

"Moreover, manufacturing processes which now endanger the lives and health of employees should be investigated promptly. Investigations upon a laboratory scale have proven inadequate for the preparation of process specifications such as the industries demand before they will adopt less wasteful methods."

In order to carry on the work of the experimental station successfully the services of R. T. Stull, a ceramist of well known ability, have been secured. He has been appointed as chief ceramist of the United States Bureau of Mines and superintendent of the government ceramic experiment station at Columbus, O. Mr. Stull is splendidly qualified for this position, having spent many years of usefulness in the ceramic field. He has been connected with a number of ceramic plants, was formerly head of the ceramic department of the Illinois university, where as instructor, he rendered efficient service and has to his credit the successful conclusion of a great number of ceramic researches, the result of which were printed in pamphlet form by the Illinois State University. He is an authority on the manufacture of enamel brick and also on the cause of and the remedies for laminations in ceramic ware.

For the past year he has held an important position with the Dunn Wire Cut Lug Brick Co. of Conneaut, Ohio.

We congratulate the United States Bureau of Mines in its good fortune in securing such a capable man for the important work to be done.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART XVI.

STEAM FOR BLAST.

As PREVIOUSLY STATED the steam pressure should be between 60 and 80 pounds which will give an air blast in the air pipe of 1½ to 2 pounds per square inch. It was also estimated that the quantity of steam should be in excess of 20 percent of the weight of the coal. If we assume 20 percent of steam, every pound of coal consumed in the producer will require 1/5th pound of steam. The evaporation of 9 pounds of water per pound of Hocking Valley coal would approximate good boiler practice. The evaporation from a boiler may be roughly determined by dividing the B.t.u. value of the coal by 970 and taking 70 percent of the result. The Hocking Valley coal has a heat value of 12564 B.t.u. and by the above rule will give a boiler efficiency of 9.1 pounds of steam. The fuel consumption for the required steam will be $1/9 = X \div .20$ from which we find $X = .022$ pound coal = 276 B.t.u. The only return from this would be to heat the air to 212 deg. F. or whatever the temperature would be for the pressure in the blast pipe, but it is evident that the heat in the steam will not suffice to heat the air. It can be shown that there will be approximately 2.2 pounds of nitrogen, .7 pound of oxygen, .20 pound of steam. The steam at 60 pounds pressure will have a temperature of 307 deg. F. which reduces to 212 deg. F., a decrease of 95 deg. F. The air must be heated from 62 deg. F. to 212 deg. F. to prevent condensation of the steam. Roughly figured the air will require 90 B.t.u. and the steam will give 11 B.t.u., leaving 79 B.t.u. to be supplied by the fuel per pound of fuel. Common practice uses more steam than one-fifth pound. Wyer gives one-fifth pound as a requisite amount, while Nagel gives three-eighths pound per 35 cu. ft. of air, for bituminous coal, which would give a much higher amount of steam than one pound per five pounds of coal. Taylor gives the same data as Wyer but adds that 25 percent more steam may be used and that the steam may be figured as one-third to two-fifths of the coal gasified, which is double our estimate, but such a high volume of steam will not give a theoretical gas corresponding with a standard gas. Likely some of the steam is taken up by the ash and undoubtedly some is not dissociated and is present in the gas as water vapor.

Evaporation of Moisture.

The moisture in the coal is evaporated in the distillation zone, and the evaporation may be assumed to occur at 212 deg. F. We determined .1532 pound of moisture per pound of coal and the heat requirement will be 149 B.t.u. per pound of coal.

Tar and Soot.

The tar and soot are variable and uncertain items. The average of 14 coals tested in St. Louis gave .072 pound of tar per pound of coal, figured on the assumption that the tar had a specific gravity of 1.2. H. H. Campbell, previously cited, found by actual test 2.5 grams in 170 litres of the gas at 150 deg. to 200 deg. C. This figures .05 pound per pound of coal on the assumption of 55 cu. ft. of gas per pound of coal. In addition to this Campbell reported 44,000 pounds of hard tar in the flues, from 8,000 tons of coal. This reduces to .003 pound per pound of coal. As the gas tested by Campbell was in use in manufacturing operations, and as the analysis of the gas closely approximates a standard producer gas, we will use his data. By combustion tests the volatile hydro-carbons consisted of 92.6 percent carbon and 7.4 percent hydrogen. We have, therefore, .0463 pound of carbon and .0037 pound of hydrogen available for combustion if the gas is used hot, which would not appear in an analysis of producer gas. This item is usually overlooked in estimating the thermal value of a gas. The caked tar in the flues, which amounts to .003 pound of carbon per pound of coal is a dead loss. Since the volatile tar is over 90 percent carbon, we will not be much in error if we assume the hard tar to be carbon, and also assuming that the soot is in equal amount. This would give .006 pound carbon to be deducted from the coal analysis. The analysis of the Hocking Valley coal in pounds is again given and is as follows:

	Original	Corrected
H	.0543	.0506
C	.6903	.6135
N	.0126	.0126
O	.1362	.1362
S	.0330	.0297
Ash	.0736	.1014
Tar		.0560

The corrections in the third columns are as follows:

Carbon in ash	.0245
Carbon in V. tar	.0463
Carbon in tar and soot	.0060
	.0768
Sulphur in ash	.0033
Hydrogen in tar	.0037

As in the coal firing, we combine the oxygen with the hydrogen to form water vapor and this requires .017 hydrogen leaving .0336 hydrogen. In the distillation of illuminating gas we get hydrogen and methane in approximately the proportion of 45 H. to 40 CH_4, but since this is distilled at a higher temperature, we will not be far wrong if we assume a 50-50 distillation. The weights of hydrogen in a 50-50 volume will be 1 hydrogen as hydrogen and 2 hydrogen in methane, and from this we get .0112 hydrogen as hydrogen and .0224 hydrogen in the methane, and the latter requires .0672 carbon and devolops .0896 methane. We have, therefore, .6135—.0672=.5463 carbon available for carbon-oxides. In a standard producer gas the CO and CO_2 are on an average 25 percent CO and 5 percent CO_2 by volume, and since equal volumes of the two gases contain the same weight of carbon, we may distribute the available carbon in proportion to the relative volumes in the standard gas.

$$\frac{.5463 \times 5}{6} = .4553 \text{ C to CO}$$

$$\frac{.5463}{6} = .0910 \text{ C to } CO_2$$

$$\frac{.4553}{12} = \frac{x}{16} = \text{Oxygen for CO}$$

$$x = .6071 \text{ Oxygen}$$

$$.4553 + .6071 = 1.0624 \text{ CO.}$$

$$\frac{.0910}{12} = \frac{x}{32} = \text{Oxygen for } CO_2$$

$$x = .2427 \text{ Oxygen}$$

$$.0910 + .2427 = .3337 \text{ } CO_2$$

We had .0297 sulphur, which will require .0297 oxygen, producing .0594 SO_2. It is possible that all of the sulphur is first converted to H_2S, but the affinity of sulphur for oxygen and the pungent odor of the gas justifies our assumption that SO_2 is formed in the producer.

Collecting the oxygen, we have:

.6071	for CO
.2427	for CO_2
.0297	for SO_2
.8795	

This oxygen is derived from the steam and air. We had .20 pound of steam per pound of coal and from this we get oxygen in the ratio of $\frac{.20}{18} = \frac{x}{16}$ in which x = .1778, and the hydrogen will be .0222. .8795 — .1778 = .7017 oxygen to be supplied by the air. The nitrogen from the air will be in the proportion of $\frac{.7017}{23.5} = \frac{x}{76.5}$ x = 2.2843 nitrogen.

We have the following results:

Water vapor		.1532
CH_4		.0896
SO_2		.0594
CO		1.0624
CO_2		.3337
H		.0334
N	2.2843	
	.0126	2.2969

In addition to this we have in the tar available for combustion. 0463 carbon, .0037 hydrogen.

The weights and volumes of gas at atmospheric pressure (29.9 Bar.) and 62 deg. F. are as follows::

	Lbs. per cu. ft.	Cu. ft. per lb.
Air	.08073	12.388
Oxygen	.08921	11.209
Hydrogen	.00559	178.931
Nitrogen	.07831	12.770
Carbon-Monoxide	.07807	12.810
Carbon-Dioxide	.12267	8.152
Methane	.04464	22.429
Ethylene	.07809	12.805
Water Vapor	.05020	19.922
Sulphur-Dioxide	.17862	5.600

Converting the gas into volume we get:

	Cu. ft.	Percent	Percent
Water Vapor	3.05	5.3	
CH_4	2.01	3.6	3.7
SO_2	.33	.6	.6
CO	13.61	23.8	24.7
CO_2	2.72	4.8	4.9
H	5.98	10.5	10.9
N	29.33	51.4	54.8
O			.4
	57.03	100.0	100.0

In the second column we have reduced the gas as given to percent volume. The values in the third column are for comparison with gas analyses. Almost invariably producer gas has from .2 to .5 percent of oxygen with its accompanying nitrogen. Let us assume .4 percent oxygen which would be accompanied be 1.5 percent nitrogen. It is evident that the gas reduced to 62 deg. F. could not contain 5.5 percent moisture. 1.69 cu. ft. of water vapor in 100 cu. ft. or 1.69 percent would be complete saturation, but gas analyses do not reckon the water vapor and it is eliminated. These are the corrections made in the third colmun.

Calorific Value.

The calorific value of the gas is as follows:

CH_4 = .0896 × 26315 = 2358 B.t.u.
CO = 1.0624 × 4359 = 4631 B.t.u.
H = .0334 × 62028 = 2072 B.t.u.
C in tar = .0463 × 14544 = 673 B.t.u.
H in tar = .0037 × 62028 = 230 B.t.u.

Without the tar we have...9061 B.t.u.
With the tar we have......9964 B.t.u.

The first gives 159 B.t.u. per cubic foot of gas and the second .175 B.t.u. The calorific value of the coal as given by Somermeier is 12564. The value of the gas, if used cold, in terms of the coal, is 72.8 percent and 79.3 percent if the gas is used hot to recover the volatile tar. In using the gas hot we must include the sensible heat of the gas. If the gas reaches the kiln at a temperature of 632 deg. F. we can determine the sensible heat from the weights of the air and their thermal capacities as determined in the discussion of coal.

Water vapor — .1532 × 256 = 39
CH_4 — .0896 × 442 = 40
SO_2 — .0594 × 95 = 6
CO — 1.0624 × 149 = 158
CO_2 — .3337 × 136 = 45
H — .0334 × 2083 = 70
N — 2.2969 × 149 = 342
Tar as CH_4 — .0500 × 442 = 22
722

This gives the hot gas a value of 10686 B.t.u., which would be 85 percent of the value of the coal. It is necessary to make one correction in each of the three heat values. It was noted that 276 B.t.u. was required to generate steam, and it is likely that the average steam consumption will exceed this assumed amount without giving any return in heat value. We then have 12564 + 276 = 12840 B.t.u. for every pound of coal fired in the producer and the percent values will be as follows:

Cold gas	70.6 percent
Hot gas and sensible heat	83.2 percent

We took the thermal capacity of tar the same as methane for which we have no authority but since the total capacity of the tar on the basis of the high calorific value of methane is but slightly more than one-tenth of one percent of the total value of the gas, we may be widely in error in this item without appreciable effect in the result. It appears that gas in its combustion must overcome a producer loss of 17 percent before it can show any economy, and this loss is under perfect conditions in the producer reactions. We based out estimate on .2 pounds of steam and assumed that all of it was dissociated, which often does not occur. Every tenth of a pound of steam not dissociated will require 165 B.t.u., about 1½ percent of the value of the gas. Higher CO_2 will reduce the value and conversely lower CO_2 will increase the value. A better coal will give a higher value and a poorer coal a lower value. We may gain or lose value in the sensible heat depending upon the distance of the kilns from the producer and the construction of the flues. It is easy to develop more fixed tar and soot than we have estimated which would increase the loss. We reach the general conclusion that a safe estimate of the average producer loss is 20 percent, using the gas hot as it comes from the producer.

The chief advantage of gas is in that it can be burned with, closely approximating, the theoretical percentage of air, and we get its full value while coal combustion is often accompanied by a heavy load of excess air. Another advantage claimed for the gas is that the kiln radiation loss is greatly reduced. Practically this is true because kilns now in operation are fixed in their grate area and the amount of coal that can be burned is limited while a much greater equivalent in gas is possible. We could, of course, add more and larger furnaces for coal and thus reduce the percentage of radiation loss, but this is beside the question.

As an illustration of the advantage of firing a greater volume of fuel, assume that we can attain and maintain a temperature of cone 1 in a kiln, and no more, and that the radiation loss is 40 percent of the fuel. This and the stack loss require all the coal we can fire. Suppose now we double the number of furnaces, none of the fuel fired in the additional furnaces will be required for radiation at cone 1, and the radiation loss drops from 40 to 20 percent of the fuel fired. The added fuel must bear its share of stack losses but there is a balance of fuel available for increased temperature. As the temperature advances, the added fuel must bear the increased radiation and stack losses, and at some higher temperature we again reach a stand still point with a radiation loss of 30 percent of the total fuel. A second addition of fuel would drop the radiation loss to 20 percent, but as the temperature again advanced the radiation loss would also advance to 25 percent. In the first instance 40 percent of each pound of coal was required for radiation; in the second at cone 1, only 20 percent would be required; in the third at cone 1 the loss would reduce to 13 percent and although we have in the third instance increased the total stack and radiation losses in consequence of the increased temperature yet the percentage of fuel required for the radiation loss at the increased temperature is 15 percent less than in the first instance. The percent of fuel represented by the stack losses is a factor of temperature and for any given temperature is constant regardless of the quantity of fuel consumed. Producer gas is readily increased in its combustion volume and the advocates of its use may justly claim this advantage—certainly in any periodic kiln now in use and the more inadequate the kiln for coal firing the greater the advantage in gas firing. The advantage of better control and theoretically perfect combustion are decidedly with producer gas in competition with coal in periodic kilns.

(To be continued.)

Written for The Clay-Worker.

NEW YORK AND VICINITY.

CONDITIONS in the up river districts are not entirely to the satisfaction of manufacturers. Labor shortage is serious. The Garner Brick Works at Haverstraw, is representative of a good many others. It has sufficient machines to turn out 44,000 brick a day, but owing to the impossibility of getting men it is not doing much more than a fourth of what its plant is capable of producing. It has five machines and only two of them are running now, nor have they been through the summer. Some plants have not operated at all, while others have run spasmodically as they could obtain help.

No one in the Hudson river district can look forward and say that at a specified time they are likely to get sufficient help to keep their plants going. A number of plants have been closed all the season and will not attempt to do anything this year. No plant has been running to capacity this season anywhere in this district.

During the past two or three weeks prices have dropped, going down to about $8.00, or thereabouts. This is due to the fact that building operations have fallen off in and about New York during the past month or two and are now at the lowest ebb for years. No indication of any improvement in this direction is shown and the outlook promises only poor business in this regard at least for the remainder of this season, and perhaps some of next.

With labor scarce and high and all production costs increasing brick makers are not anxious to do much business and are planning to close down as soon as they feel they can. No more burnings will be laid up in most localities and those that are now burning will be rushed out as soon as they can be and the yards will close.

BRICK IN NEW JERSEY.

Last year's brick product in New Jersey was $9,749,524, compared with $8,353,296 in 1915, an increase of $1,396,228. The output this year ranks New Jersey fourth in the list of producing states, according to figures given out by the departmen of Conservation and Development. The increase in value is due to the increase in prices rather than to a greatly enlarged output.

Common brick numbered 328,419,000, valued at $2,366,614, a decrease in output of 21,015,000, but an advance in value of $421,808. Fire brick numbered 37,891,000, valued at $1,162,794, a decrease of 2,346,000 in number, but an increase in value of $265,352. Architectural terra cotta produced was valued at $1,818,052.

THE CERAMIST'S CORNER

This is a department which appears in The Clay-Worker from time to time dealing with practical and technical matters of especial interest to the ceramist. We are indebted to Mr. L. E. Barringer, Engineer of Insulation for the General Electric Co., Schenectady, N. Y., and a former president of the American Ceramic Society, for the following article on Ceramic Engineering.

TWENTY-FIVE YEARS AGO such a thing as ceramic engineering did not exist. The word ceramics itself was generally understood to apply to art pottery such as one sees in Fifth avenue shops or in museums. The production of pottery or ceramic wares was an industry of mystery and rule of thumb and, as in the case of the Chinese and Japanese potters of centuries ago, the industry was carried along largely by being handed down from father to son.

A recognition upon the part of Edward Orton, Jr., of Columbus, Ohio, that the same fundamental principles were involved in the production of not only the art ware popularly designated ceramic ware, but also of brick, tile, terra cotta, sewer pipe, porcelain, glass, enamels, cement, and other allied products, led to the creation in 1894 of a Department of Ceramics at Ohio State University and the appointment of Prof. Orton as its director.

- CLAY WARES
  - Architectural or Structural
    - Brick
    - Terra Cotta
    - Tile
      - (Floor
      - (Wall
      - (Roofing
    - Chimney flues
    - Fireproofing
    - Sanitary porcelain
  - Industrial
    - Firebrick
    - Gas retorts
    - Muffles
    - Chemical stoneware
    - Chemical porcelain
    - Glass pots
    - Saggers
    - Grinding wheels
    - Filters
  - Public Service
    - Paving brick
    - Sewer pipe
    - Conduits
    - Insulators
    - Drain tile
  - Service Domestic
    - Utilitarian
      - China or tableware
      - Cooking utensils
      - Jardiniers, flowerpots, etc.
      - Stove linings
    - Ornamental
      - Decorative pottery
      - Decorative tiles
- GLASS WARES
  - Architectural
    - Window glass
    - Lighting fixtures
    - Skylights
  - Public service
    - Insulators
    - Globes and reflectors
  - Domestic service
    - Utilitarian
      - Cooking utensils
      - Tableware
      - Fixtures
        - Towel racks, knobs, etc.
    - Ornamental
      - Vases, dishes, figures, etc.

CEMENTS: Portland cement, slag cement, natural cement.

- ENAMELED WARE
  - Industrial
    - Enameled steel-vats and tanks
    - Enameled resistances
  - Public Service
    - Enameled signs
    - Reflectors
  - Domestic Service
    - Enameled sanitary ware
    - Enameled cooking utensils
    - Enameled jewelry

The basis upon which this work was started was that of bringing into one group all products involving the use or formation of silicates and the term ceramics was deemed the proper one to cover this field of the silicate industries, clay, glass and cement.

In 1899 the American Ceramic Society was formed to promote the arts and sciences connected with ceramics, the term "Ceramics" being then understood to cover the silicate industries or those lines of work involving the use or production of silicates, chiefly clay, glass and cement. This society now has over 500 members, mostly men with a technical training. This group of chemists, engineers and others use the term Ceramics in its broader meaning, as above defined and this later and more consistent meaning is rapidly finding wider and wider use.

The accompanying tabulation will serve to show the very great extent to which ceramic products are used. This table is not presented as being absolutely complete nod the classification one which should be considered entirely satisfactory, but the grouping will indicate the diversity of uses to which ceramic products are put. We are so accustomed to such products in our homes, cities, and places of business that we seldom think of the value of ceramic wares to the comfort and efficiency of mankind.

Probably there is no field of industry which can be more sharply defined than the ceramic industry, either from a chemical standpoint or upon the basis of the processes involved.

A distinct field exists for technical training and professional or engineering work.

At the present time ceramic engineering courses are offered at the Ohio State University, University of Illinois, Rutgers College, University of Iowa, Oregon School of Mines and Alfred University.

Training in ceramic engineering must include the usual engineering courses in chemistry, physics, mathematics and mechanics. Where the training begins to become specialized in the junior year emphasis is placed upon the chemistry of silicates, their constitution, formation, classification, properties, etc. Particular attention is, of course, given to the effect of high temperatures upon various materials used to form complex silicates, and a thorough study is made of the effect upon the vitrification range and fusibility of silicates by various oxide and other materials. The study of mechanics is particularly important as applied to the drying and burning of clay wares, the fusion of glass and the clinkering and grinding of cement.

The ceramic engineer must have a good working knowledge of furnace design, fuels, automatically controlled steam heating and humidifying apparatus for drying, the general theory of drying clay wares, etc. The machinery used in forming clay wares is of a type peculiar to the industry and requires special study.

Summing up, therefore, it can be said that during the past 25 years the field of ceramic engineering has originated to cover the very broad and important field of ceramic products, or those materials involving the use or formation of silicates. Training for ceramic engineering is now offered by six colleges or universities, and the American Ceramic Society has been created to serve the usual purpose of those interested in the same line of work, technically or industrially.

It is rather peculiar that the oldest industry in the world should be the latest to organize upon an engineering basis with recognition that scientific principles underlie most of the operations involved in manufacturing ceramic wares. This is probably due, however, to the very fact that the industry has been handicapped by a great many centuries of tradition and long established practice.

THE VARYING IN SIZE OF FIREBRICKS.

IN A REPORT of the Refractory Materials Committee of the Institute of English Gas Engineers, read before their meeting in London on June 5 last, Mr. J. W. Mellor gave the results of experiments made with firebrick in standard sizes as to the expansion between cold and hot bricks. The tests were made in the County Pottery Laboratory, Stoke-on-Trent and the first of a series of such tests to be made.

In the firebrick to be tested two saw cuts were made, each cut intended to hold a pointed platinum wire and the cuts so arranged that the wires would hold tight. The whole firebrick were measured with a Coppee's apparatus, while the distance between the tips of the wires was measured with a cathetometer provided with an invar scale. These measurements were all made while the firebrick were cold. The firebrick were then heated in a kiln to a certain temperature. The test kiln was provided with openings so that the distance of the wires could be measured. The following table will give the results which were obtained.

Class of Brick	Distance between platinum wires in centimeters		Percentage Expansion	Linear Co-Efficient of thermal Expansion
	Cold	After firing		
Silica brick	17.95	18.05	0.56	0.0000048
Fire brick	18.78	18.87	0.51	0.0000044
Fire brick	20.31	20.45	0.69	0.0000059
Fire brick	19.43	19.50	0.36	0.0000031
Fire brick	20.06	20.25	0.95	0.0000082
Silica brick	20.29	20.43	0.69	0.0000059
Fire brick	19.83	19.94	0.55	0.0000047
Fire brick	19.80	19.92	0.61	0.0000052
Fire brick	19.01	19.06	0.26	0.0000022
Fire brick	18.35	18.42	0.38	0.0000033
Fire brick	18.68	18.80	0.64	0.0000055
Fire brick	18.55	18.66	0.62	0.0000053
Fire brick	18.77	18.83	0.32	0.0000028
Red silica brick...	19.29	19.46	0.88	0.0000076
Silica brick	18.27	18.41	1.77	0.0000066
Silica brick	18.52	18.78	1.40	0.0000122
Fire brick	18.53	18.66	0.70	0.0000060
Fire brick	18.84	18.98	0.74	0.0000064
Fire brick	19.50	19.70	1.03	0.0000088
Magnesite brick ..	18.39	18.66	1.47	0.0000126

If the fire or silica brick are not burnt right, then there was noticed an after-contraction or after-expansion as the case may be which has effect on the thermal expansion. In consequence in the former case the results are too small and in the latter case too large. Another phenomenon observed was that the firebrick does not contract to its original volume on cooling. The difference between the cold sizes of the fire brick before and after firing shows the magnitude of the after-contraction or after-expansion, when the fire brick were heated under conditions of the experiment.

It was further observed that in all cases of after-contraction the firebrick showed a smaller volume at, say 1180 degrees Centigrade than it does at, say 1060 degrees Centigrade. This shows that the effects of thermal expansion are altogether masked by the after-contraction. For example:

The distance between wires at 15 degrees was 18.72 centimeters.

The distance between wires at 1060 degrees was 18.80 centimeters.

The distance between wires at 1180 degrees wos 18.75 centimeters.

It was only when the whole of the cold and hot measurements were under consideration and were being extended to different temperatures that the dual character of the phenomenon was discovered. The committee suspects these and other measurements of the coefficients of thermal expansion of refractory materials at high temperatures, unless it can be demonstrated that the results are not affected by the error under consideration.

These measurements also show that the coefficient of expansion of fireclays and silica brick decreases with the rise of temperature. This is shown in three cases as follows:

	I	II	III
From 15 deg. to 940 deg.	0.0000069	0.0000081	0.0000051
From 15 deg. to 1180 deg.	0.0000060	0.0000060	0.0000064

It will be observed that the coefficient of thermal expansion represents the average increase in length which a break undergoes when unit length is heated 1 degree Centigrade; so that a 9-inch firbrick with a coefficient of 0.0000005 will be $9(1+0.0000005\times1.200)$ or 9.054 inches long at 1200 degrees Centigrade. Or otherwise expressed, a firebrick 2½ inches thick when cold will be $2\frac{1}{2}(1+0.0000005\times1.200)$ or 2.515 inches thick at 1200 degrees Centigrade. Therefore, sixty-six firebrick piled one on top of the other and neglecting the fire clay joint would expand one inch when heated to 1200 degrees Centigrade.

Written for THE CLAY-WORKER.

HEARD IN NEW ENGLAND.

THE situation in Maine seems to be fully as good as it has been in years past. Considerable building is going on, though perhaps not as much as would have been done under more favorable conditions. The New England man is not anxious to spend his money unless he sees some indication of it coming back and many think the present high prices for building are indicative of a possible slump that will lose present builders money. Brick have sold as high as $15 in some Maine cities this year, but they are now below that and prices seem to be declining. Some sales have been made as low as $9.00 to $10.00.

The Purinton Brothers Company, of Augusta, Me., recently started the fire under their second kiln this season. It contains twenty-four arches with 600,000 brick. The other was not quite so large, but both bring the total for the season up to about the usual number.

The old Hawkes brickyard in Westbrook, Me., is in operation. Baird & Peters took it over this season and expended something like $25,000 on improvements. It was necessary to replace much of the machinery and all the buildings required a good deal of repairing to make them usable. The tracks all over the yard were rusted out so they were useless and new rails were needed. The yard started with a full complement of men early in August and in addition to making brick will make fancy tiles and some other specialties. Arrangements are to be made to run some of the departments the year round. It is twenty years or more since this yard was operated. The clay deposits near are inexhaustible and the supply easy to reach. The new firm expects to make a quality brick which will be wanted by builders all over Maine.

The situation in Massachusetts is rather critical, largely because of the shortage of labor. Munitions factories, enlistments in the army and the recent draft have depleted the ranks of labor until it is difficult to find men enough to keep the yards in operation. The class of labor wanted in the brick yards is very scarce and though good wages are offered it is next to impossible to secure men to carry on the work.

The high cost of production and the reduction in prices are influencing manufacturers to quit. Some plants will only burn the brick which are now in preparation. A few have stopped work in the pits and will shut down as soon as the brick now under way are burned. Others will continue operations until the season closes.

The building situation in Massachusetts is not the best, though perhaps it is better than it is in some localities, partly because the rate of building has not yet caught up with the increase in population in some districts. This is due to the growth in manufacturing. No large mills are in process of erection now, however, and nothing indicates that any are to be built in the near future. Conservatism seems to characterize the entire business fabric and brick men have caught the infection from other enterprises. Many are looking forward to next year and hoping for better things, but this season will soon close. HIRAM.

THE PREPARATION OF CLAYS, MINING, DRYING AND PROPER MIXING.

By W. W. Swengel.

NO DOUBT BUT that many of the failures of brick plants in the past resulted partly through lack of interest or knowledge of the average clayworker along the line of scientific preparation of clays and shales, and many more never reached that degree of efficiency which was possible had there been given as much study and attention to this end of the manufacturing, as has been displayed along any one of the other departments of the process.

It seems to be the rule with many manufacturers to worry along, struggling to overcome difficulties encountered through the entire process without trying to locate the real cause at the source, and there is no doubt, if the cause were removed, the effect and results obtained thereafter would be most profitable and satisfactory.

Mining.

The methods adopted by many of the larger plants, which have several kinds of material in the same clay pit, and which may be vastly different in their chemical and physical properties, have been to mine them by the use of mechanical devices, believing that they will be properly mixed in satisfactory proportions throughout the year and produce a uniform product.

There is no doubt but that this plan of operation is by far the most economical insofar as the actual cost of mining is concerned. But on the other hand, where they save ten to fifteen cents per ton on the mining, they lose from one to two dollars on each thousand brick manufactured in the succeeding operations, due to the uneven mixture of clays. There are few shale banks which contain both shale and soft clay, that one of them does not increase in thickness as the mining is advanced into the bank, and if either one of the stratas increase or decrease in thickness, the mixture is sure to change in like manner, and many times result in loss and much trouble throughout the manufacturing.

The Mixing of Clays.

Many plants use a certain amount of soft plastic clay in their mix for the purpose of its bonding capacity, owing to the shale being more non-plastic, which offers many advantages if properly mixed. But no wonder that many plants have continual trouble and loss when you consider the haphazard and antiquated methods employed in the preparation of the raw material. It may be necessary, when possible to do so, that both the shale and clay be mined separately and mixed mechanically in exact proportions after being ground and screened.

It has been advocated that the proper way to mix clays, is by making use of several large ground clay storage bins, by spreading mechanically in successive layers of the clay over the entire bin by the use of a tripper conveyor until the bin is filled, after which the clay is allowed to flow from the bottom end of the bin onto a reclaiming conveyor. No doubt but that this plan of procedure will work in some cases; but is it practical on plants where the proportions of the different clays or shales changes in the pit? To illustrate, suppose that in a clay pit which has a vein of shale 20 feet in thickness, is overlaid with a layer of soft clay 5 feet in thickness, the mixture being 4 to 1 this month while filling bin No. 1. Next month the soft clay increases to 10 feet, giving a mixture of 2 to 1 while filling bin No. 2. Then considering these conditions, is it possible to produce ware of the same uniformity, unless there is some system by which the desired proportions making up the mix are held uniform month after month, and year after year.

The Aging of Ground Clay or Shale.

There is no doubt but that the working qualities of a clay or shale will be improved when same is too non-plastic, if allowed to age after being ground, by employing large storage bins. But there are cases in which the trouble can be overcome in a far easier and less expensive way than by installing large storage bins. For example, there are cases where the trouble is caused by the mix containing too much sand, which often occurs unnoticed, being part of the over-burden, or found in pockets, or it may be that a vein of sandy shale rock or quartz is allowed to enter into the mixture, any of which if in excess, will cause the brick to check at the machine, in addition to many other troubles which are sure to happen. The aging of the mix under these conditions would have very little effect, and the only way to overcome trouble from this source, is to be more careful in the selection and the mixing of the raw material.

The Drying of Clay.

Often the capacity of the plant is curtailed, owing to the damp material. By the drying of the clay mechancially, a maximum output is assured throughout the entire year, where formerly the capacity was reduced in winter and wet seasons, causing the plant to lose the profits earned during the dry season. It has been the practice of many plants that manufacture brick of soft clay, to close down their plants during the winter for the reason that they are unable to mine and work the wet clay. The time is here and the demand for brick so great in some districts, that it will be necessary to operate the entire year, and the only solution for such plants is to install clay dryers. The advantages to be gained by continuous operation are many, in the way of reduction of overhead charges, the holding together of the yard crew, which is quite a proposition just at this time, and last but not least, the profit gained on the additional number of brick manufactured.

To wet or damp clay can be charged the loss of many thousands of dollars each year. Whereas, the additional capacity gained by drying the clay would have resulted in a nice margin of profit on the right side of the ledger, turning a losing proposition into a money maker, which has been the experience of several well known plants. It is just as important in many cases, to have a clay dryer for the purpose of drying damp clay, so as to be able to eliminate pebbles, to enable the plant to make **proper and exact mixtures,** and last but not least, to enable the plant to maintain a maximum capacity, as it is to have down draft kilns to burn the brick in. And on many plants the clay dryer might be termed the missing link in the chain.

Pugging.

Owing to the irregular mixture of the clays, the pugging of same is a difficult proposition. In most cases, the pugger not only operates the flow of water, but the flow of clay, having three or possibly four varying quantities to deal with. He regulates the flow of clay to agree with the desired capacity of brick, endeavoring to secure an even flow, he has the water to regulate to suit the amount of clay in the mill, has to watch the condition of ground clay admitted, with its variation in water content, and the variation in mixture, if using two or more clays or shales. The result of these faulty conditions is the cause for waste and loss of time, labor, and power in addition to other troubles that can be traced back to the uncertain mixture.

Uneven Mixture Effects Paving Brick.

In the case of paving brick, the alternating of the consistency of the mixture, as well as the continual changing in the proportions of the plastic and that of the non-plastic material, has its evil effect in the porosity and density of the brick, which may be one of the causes for variations in the rattler test.

After studying the opinions and arguments advanced by paving brick manufacturers, relative to the cause of lamination, we come to the conclusion that a great deal of this trouble is caused by either the clays not being mixed in the right proportions, or that the mixture contains an excess of one clay which is too plastic. Where, if after experimenting, it may be found that by eliminating part of one clay making up the mix, a mixture may be determined upon that will eliminate the lamination and produce a high grade paver.

The correct procedure on plants having trouble with the mix as outlined, when possible, should be to mine each clay or shale separately, drying the damp clay in order to screen same, after which they should be mixed mechanically, in exact proportions to pug mill, the water also, should have a uniform pressure, thus producing a uniform column of uniform consistency, mixture and porosity, resulting in a reduction of power, less repairs, less lamination, less cracked brick, producing a uniform brick each day in the year.

In addition, the plant would produce a maximum output, which in many cases would turn a losing proposition into a money maker.

HUDSON RIVER BRICK SHOWS INCREASE IN VALUE.

The supply of common building brick for the enormous consumption of Greater New York, the largest brick market in the United States, comes principally from the narrow strip of land on either side of the Hudson from New York City to Cohoes, including Bergen county, N. J. Every county in this region contributes to the supply except one—Putnam—and in late years the Raritan district, in Middlesex county, N. J., has contributed largely to the Greater New York market.

In 1916 the number of brick marketed in this region, according to a report in preparation by the United States Geological Survey, Department of the Interior, was 893,552,000, a decrease of 66,975,000 brick. The value of this output, however, was $5,915,254, an increase of $906,189 over 1915. The average price per 1,000 brick was $6.62, an increase of $1.41 over 1915.

The New York part of the region is by far the larger producer, reporting, for 1916, 702,596,000 brick, or 79 per cent. of the total, valued at $4,552,468, or 77 per cent. of the total for the region. This was a decrease of 38,972,000 brick, but an increase of $807,920 compared with 1915. The average price per thousand in this part of the region increased $1.43, or to $6.48. Ulster was the leading county in this part of the region, reporting 222,651,000 brick, valued at $1,444,275, a decrease of 6,692,000 brick but an increase of $333,783 in value, compared with 1915.

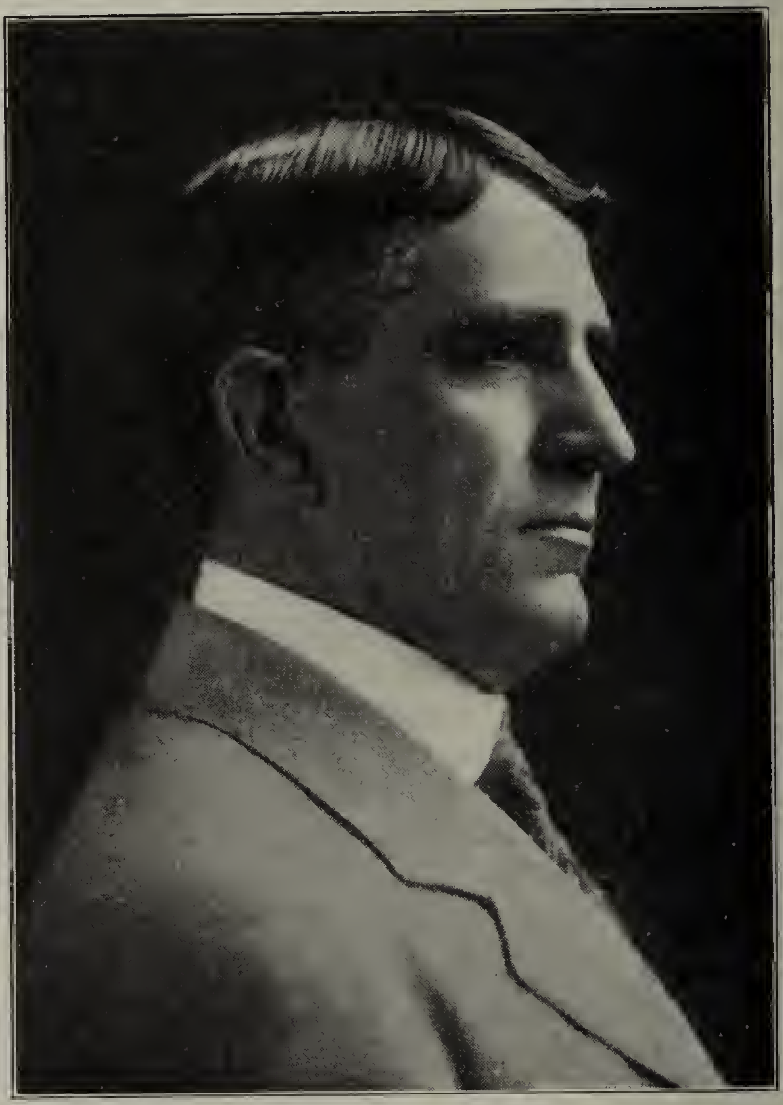
The New Jersey part of the region reported 190,956,000 brick, valued at $1,362,786, being a decrease of 28,003,000 brick, but an increase of $98,269.

BOOSTING HOLLOW TILE.

Praiseworthy Efforts of Mr. H. C. Downer, Malvern, Ohio.

THE MANUFACTURE OF HOLLOW BUILDING TILE is relatively a modern process; nevertheless, it is becoming one of the leading branches of the clay industry, and hollow tile is growing in popularity with builders as its merits are better known and appreciated. Educating the public is a process of slow growth, but the building public of the Nation is surely, if slowly, learning the economy and advantage of hollow tile in structural work, thanks in no small measure to Mr. H. C. Downer, whose portrait decorates this page.

Mr. Downer is a clayworker by birth. When he was born at Irondale, Ohio, his father was operating a building brick plant and during his boyhood days, he worked on the yard when not at school. In his teens his ambition for business achievement took him away from the brick plant for a time. For three or four years he was employed by the Pennsylvania Railroad Company, but in 1906, he returned to his first love, the clay business, and became secretary of the Whitacre Fireproofing Company. Six years later he and a number of associates formed the Malvern Clay Products Company and established a model, modern plant at Malvern, Ohio. The plant has a daily capacity of three hundred tons of hollow building tile and fireproofing, which finds a market far beyond the lines of the Buckeye State.

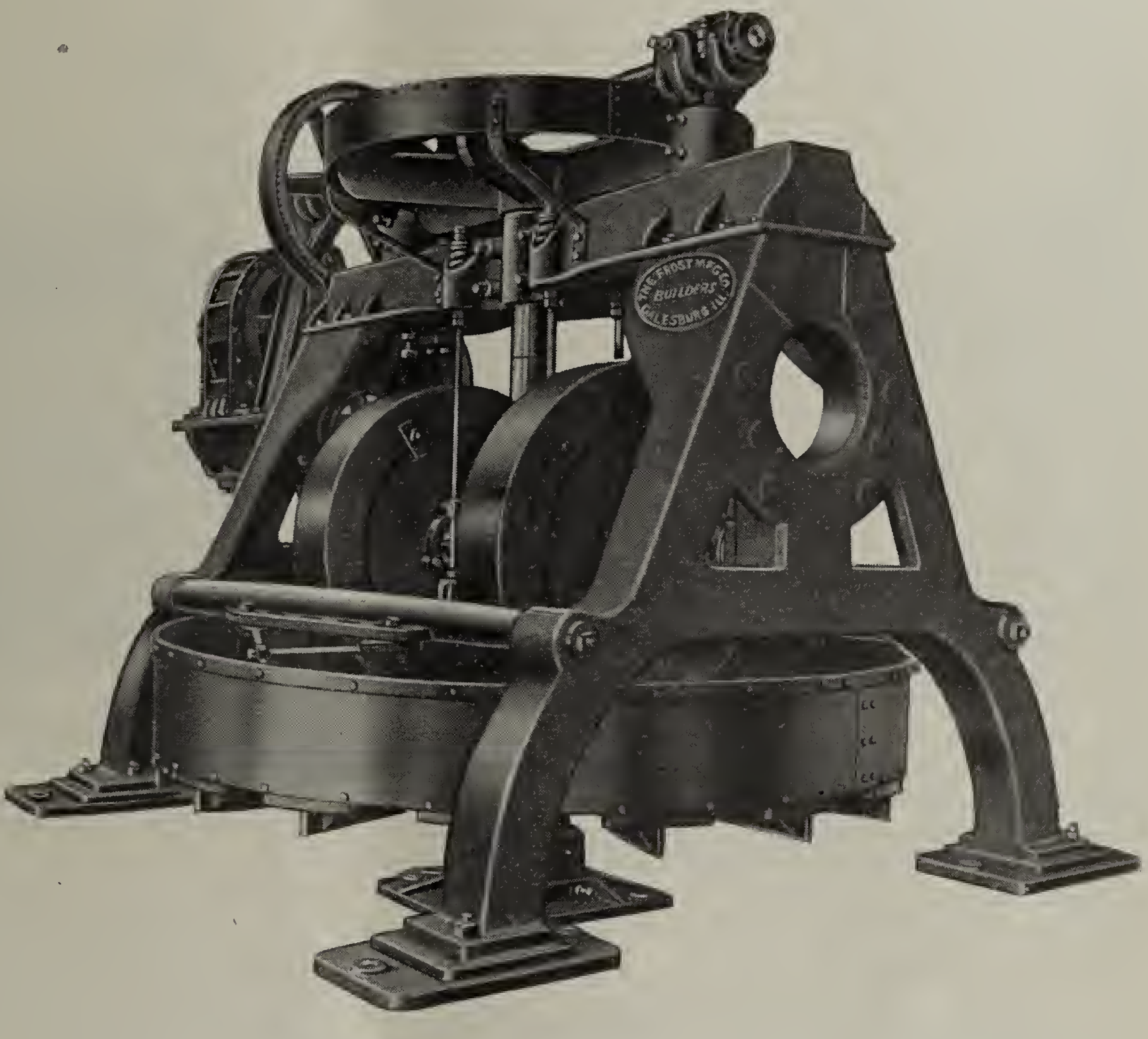


H. C. Downer,
President National Hollow Building Tile Association.

Believing thoroughly in the superior merits of hollow tile as a building material, and appreciating that the building public needed education in the importance of better construction and a larger use of non-burnable building materials, Mr. Downer took an active part in organizing the National Hollow Building Tile Association and is now the chief executive of that organization, the objects and purposes of which are to promote in all proper ways a more extensive use of hollow building tile. The present membership of the Association represents a total yearly capacity of more than two and a quarter million tons, and it is safe to predict that under Mr. Downer's efficient direction, the association will grow both in membership and influence and as a result of its publicity work, the demand for hollow building tile will increase steadily, barring, of course, the temporary interference of war conditions. Mr. Downer is a young man, and undoubtedly will live to realize his ambitions and see hollow tile supersede cement and frame construction to a large extent throughout the Nation. It is a worthy ambition and in its success the building public will be the chief beneficiaries. Long life and success to you, Mr. Downer!

FROST DRY PANS, WET PANS, ENGINES AND BOILERS.

THE PROPER PREPARATION of the clay is a very important detail in the manufacture of high grade clay products, especially paving brick, terra cotta, etc. The Frost dry pan has a record for efficiency and service that is quite unusual. For more than a quarter of a century it has been an important part of the mechanical equipment of many of the largest clay plants of the country. We are pleased to illustrate the latest and most improved type of pan made by the Frost Mfg. Co., Galesburg, Ill. It is motor driven and the wearing parts are all made interchangeable which minimizes the trouble and expense of repair incident to heavy service. The company also manufactures a wet pan of equal excellence which is built for heavy duty. It may be filled and emptied automatically, and when desired a small air hoist is employed to lift or dump the scoop or the shovel. One small valve is all the machine tender needs to manipulate in order to empty this pan, whether the batch be stiff clay, sand or other material. Frost pans have several other original features, and are built in varying sizes to suit the needs of individual users. For full particulars see ad on page 297 or write the Frost Mfg. Co. direct, stating the capacity pan desired. The firm also manufactures a complete line of boilers, engines, feed water heaters, tanks, air receivers and other power plant equipment, and will be pleased to send catalog of same to any reader of the Clay-Worker on request.



Frost Dry Pan Which Has a Wonderful Record for Durability and Efficiency.

NEW FIRE BRICK PLANT NEARING COMPLETION.

The Trautwein Dryer & Engineering Co., the engineers for the new fire brick plant of the A. P. Green Fire Brick Co., at Mexico, Mo., report that the plant is rapidly nearing completion. The equipment which is being installed will enable them to operate continuously with greatly increased capacity and will materially aid their present enormous production. Eight round down draft kilns will be used at the start. A Trautwein steam dryer of modern design and construction will be used to dry their ware and the power plant will be ample for future expansion and growth. All their equipment is on the ground and the yard should be in operation inside of thirty days.

SALT GLAZED BRICKS.

A building contractor was encountered the other day who was on the way to look up some salt glazed brick for a new church building and was making inquiry about them. The interest manifested by this contractor on the subject was enough to reawaken thought upon an item in the brick industry that has received but little attention during the past few years, but has not been kept very actively before the public mind.

In this case the contractor said he had been using a red brick in his town that after a time would bleach out and show white spots and streaks which were objectionable, and he was casting about for something else, something that would hold its color. The manufacturer who makes a salt glazed brick had invited his attention to these and promised him that they would hold their color.

The salt glaze on burned clay is a unique feature and in the way of finish it offers one of the most permanent qualities obtainable. There is something about the salt glaze, whether it is on brick, sewer pipe or other burned clay, which renders it impervious to acids as well as moisture and it is said to resist the elements better than any other surface. With this quality recognized if the salt glaze can be furnished along with attractive and dependable colors there should be room for more development in the use of salt glazed brick and a good chance for some active promotion on the part of those who are in a position to supply this product.

VITRIFIED BRICK ON THE LINCOLN HIGHWAY.

The Finest Stretches of the Famous Highway in Indiana and Ohio Are Paved With Brick.

A GOOD BRICK ROAD AND A POOR ROAD SIGN ON THE LINCOLN HIGHWAY.

THE COMMISSIONERS of Crawford County, Ohio, have abolished an annoying road sign shown on the accompanying photograph. The local advertiser who had the signs erected was notified by the commissioners, because of their similarity to a railroad crossing sign, that they would have to be taken down or changed in such a way as to prevent the traveler being led astray by them. The advertiser has complied with the orders of the commissioners.

These signs are being erected in many parts of the country and the Crawford county commissioners hold that because of their similarity that they are not only annoying to the traveler, but are dangerous, because he is likely to mistake the regular railroad crossing sign for another of these advertising signs and to ignore the warning with disastrous results. The Crawford county commissioners had no desire to work a hardship on either the advertiser or the firm selling the signs, and in order to be sure of their position they took a census of tourists and find that they are usually hostile to these signs and that their hostility in some cases result in their demolishing the signs with a club. This was proof to county commissioners of Crawford county that the signs are not good advertising and that instead of creating good will on the part of the reader, they made him vindictive toward the advertiser, and this extends not only in the strange country, but in the home town of the tourist and he is found to have unkind feelings toward his own home store which has been led into using this type of advertising. The commissioners therefore had no hesitation in putting these signs out of business.

The local advertiser, who is a Bucyrus shoe man, has cheaply and easily remedied the matter by attaching the two boards separately in the shape of a "V," the apex of which is on the left hand side. The people manufacturing these signs have led the advertiser to believe that they are good advertising because evrybody seeing them will take them to be a railroad crossing signal and will very naturally slow down, giving them ample time to read the sign. While this is true, it does not engender any pleasure or good feeling on the part of the traveler who has thus been fooled. As stated, the commissioners of Crawford county have taken the matter up with the State Highway Department with a view of having this nuisance suppressed.

MORE LINCOLN HIGHWAY BRICK-PAVED.

John E. Hopley, Ohio State Consul of the Lincoln Highway Association, Bucyrus, Ohio, recently announced that two more miles of standard brick paving is to be added to the Lincoln Highway to the east of that place.

Crawford county, Ohio, in which Bucyrus is located, now has some of the finest brick roads to be found on the entire highway and some of the best to be found anywhere in the country, and it is said that with the additions just mentioned and eight miles planned to be completed within the next two years the Lincoln Highway route across the entire county will be a perfect permanent road.

This is the kind of thing we like to hear about, not only in connection with the Lincoln Highway but with all other prominent highways through the country. It not only means better and more permanent highways but it is good advertising of the brick-paved way which should tend to encourage others to follow suit.

In road building as in street making and everything else nearly, the best is the cheapest in the end. It costs a little more at first to build a well-paved brick roadway but it generally proves cheaper in the end because when once properly made the brick roadway is permanent, needs but little, if any, repair while other roadways must have a repair fund which in a few years amounts to more than the difference in the first cost in building permanently and paving with brick.

HIGHWAY SIGN POSTS.

Speaking of the Lincoln Highway, which is the most widely advertised stretch of good roads in the world, why not let us have a fair share of burned clay monuments along this highway? A recent report from Salt Lake, Utah, tells of preparations being completed for sign posts on the Lincoln Highway between Salt Lake City and Ely, Nevada, by the Automobile Club of Southern California.

A Good Brick Road and a Poor Road Sign on the Lincoln Highway, Near Bucyrus, Ohio.

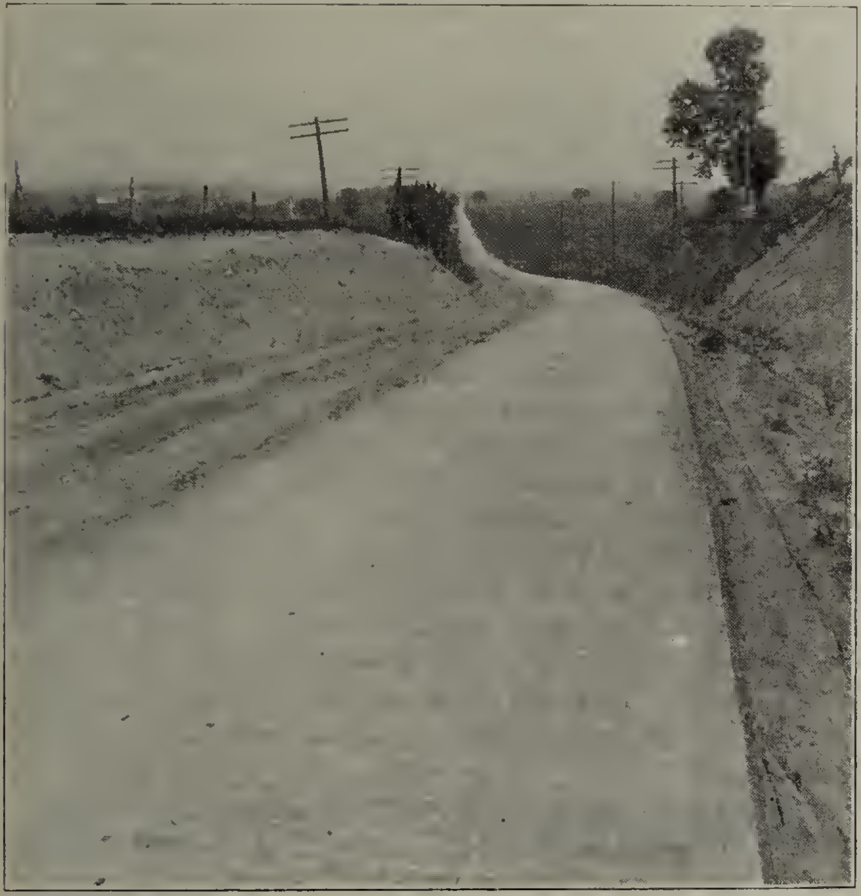
That which sets us to thinking about clay products is the statement that the road signs are to be made permanent. There is nothing more permanent than clay products and there is nothing much more fitting in this connection than for the industry to see that all along the highway there is a goodly share of pier posts of gateway type made of brick and terra cotta and other clay products.

CONVICTS USED SUCCESSFULLY ON NEW YORK ROADS

Owing to the scarcity of labor for road repairs and maintenance in New York in 1916, a number of gangs of convicts from three of the state prisons were employed in such work. The second deputy highway commissioner, Fred W. Sarr, makes the following report on the results of this experience: "The use of convicts on the highway work resulted in a considerable saving to the state in both the Highway Department and the Prison Department, and it is recommended that the practice be continued, at least as long as the present stringency in the labor market continues." The men were taken to and from the work daily when the roads where they were engaged were comparatively near the prisons, and in other cases they were temporarily housed in rented buildings near the roads. The latter plan seemed to be more satisfactory when the work was more than ten miles from the prison.

UTILIZING LOCAL ROAD MATERIALS.

IT IS APPARENT that road builders must use local rock and gravel wherever practicable this year, not only because the cost of commercial supplies will be high but also because rail shipments of all building and construction materials seem destined to suffer more or less delay in order that food and munition supplies may have right of way. For this reason the geological departments of the different states can render valuable public service by publishing whatever information regarding local rocks and gravels they possess. Some have already done so, but few have gone into the subject with the thoroughness marking the work of the Canadian Department of Mines. In the summer of 1914 it began the investigation of road materials along certain waterways on which they could be shipped cheaply and along certain of the more important proposed highways. This work has been continued since then, with the result that there is a good knowledge of the local resources for road construction in parts of three provinces where such work is most active. The methods of testing rocks developed by the U. S. Office of Public Roads are employed in the laboratory, and these experimental investigations are supplemented by careful observation of the behavior of the materials in roads carrying traffic of different densities. In this way the relation between the theoretical and practical values of the various rocks and gravels is being determined, and the authorities who contemplate road improvements will be able to select the least expensive materials which will answer their requirements.



Smooth Riding the Year Around on this Brick Paved Section of the Lincoln Highway, Near Wooster, Ohio.

BRICK NOTES FROM DIXIE LAND.

August, 1917, building figures in Memphis were $244,335, as compared to $280,765 for last year. In the past month 117 permits were issued, as compared to 192 in August, last year. The New Citico Brick Co., of Chattanooga, has been incorporated with a capital stock of $25,000 by A. C. Earnest, E. H. Carnes, E. B. Shadden, D. S. Zachary and John D. Cantrell to manufacture brick, tile and other clay products.

Memphis suffered a fire in the principal retail district on South Main street, September 11, the store of Jos. Rosenfield Co., ready-to-wear and shoes and clothing, a four-story building owned by the Hamilton estate, burned to the ground. It was an old structure but had been remodeled about a year ago, and its destruction means the erection of a good, fireproof structure.

A permit has been issued for a new factory and warehouse building for the U. S. Bedding Co., Memphis. Ozanne and McKnight are the contractors.

Nashville has an important municipal election this week. Among the names to be voted on for Commissioner of Streets, Sidewalks and Sewers is that of E. T. Lewis. Mr. Lewis has done notable work for his home city, building the addition to the pumping station, rebuilding the city reservoir, the approaches to the Jefferson and Sparkman bridge and other property.

Work, it is understood, will go forward again soon on the aviation buildings at Millington, Tenn., north of Memphis, the contract for which was given the Thomas-Harmon Construction Co., of St. Louis. Work had progressed to a certain extent and was suddenly stopped but I. G. Harmon indicates that as soon as certain contracts are signed work will proceed. Several hundred acres of land leased here will probably be the permanent aviation school for this section.

A Fine Stretch of Brick Paved Road Near Richmond, Ind., as Good as New After Five Years' Use.

"PAVE WITH BRICK."

One day the county commissioners met,
And argued about the material to get,
To fix up the roads to make traveling good
And have them the best that they possibly could.
One argued that crack' stone alone was the stuff
Although it at times made the traveling rough.
Another said, "Asphalt is just what we need
To make the best road in the country." "Indeed,"
Said another, "I see you have very poor taste,
You must think the county has money to waste.
Just listen to me while this thing I unravel,
To settle this thing we'll repair it with gravel."
"But don't make your final decision too quick,"
Said the wisest of all, "Why we'll pave it with Brick."
"To pave them with brick you will show common sense,
For it banishes all the repairing expense."
So after debating the question awhile
The wisest among them arose with a smile
And said, "You show wisdom when you make your pick,
If your final decision is to Pave with Brick."

—James L. Carson.

SELLING UNITED STATES CLAY PRODUCTS IN LATIN AMERICA

By Alfred Thomas Marks,

IN THE TWELVE MONTHS ended on January 31, 1917, the United States exported to South and Central America brick and clay products, brickmaking machinery, etc., to the total value of nearly three millions of dollars, as against $1,546,380 in the corresponding twelve months ended on January 31, 1916. This rather remarkable increase in one year may be taken as conclusive evidence of the fact that the Latin-American markets in these lines may easily be taken over by our exporters if they will but put forth the effort necessary to win them. Our Latin-American sales in all clay products and related lines are practically coming to us without effort or solicitation on our part. It naturally follows that, were we to exert ourselves in cultivating these rich and growing markets, using the methods successfully followed by Latin-America's former sources of supply—England and Germany—this business could be made a permanent and substantial part of our foreign trade.

Taking the export question in its larger aspects, what particularly matters is not that we are selling to the world brick and clay products of the value of nearly ten millions of dollars a year. What is of vastly more importance, magnificent as the present total is, is that we be able to hold this trade (or a substantial part of it) after half the world has laid aside its arms, and the industries of the now-warring countries once more get into their normal stride.

What are we doing today to hold the trade of tomorrow? Are we satisfied just to consider ourselves lucky in being able to grab the derelict clay products trade set adrift by the world-conflagration, fill the orders coming to us, bank the money, and sit back with the smug assurance that we have the trade "cinched"? Are there any American manufacturers in these lines so unwise and short-sighted as to feel that it will be safe and good business to let future conditions take care of themselves? What are we doing to put a lasting and permanent foundation under our foreign trade? That is the question. And right now is the time to get an intelligent grasp on the facts.

In order to demonstrate just what our duty should be at this time and under present abnormal circumstances, let us consider Latin America, probably our most promising after-the-war market—a trade we stand a better chance of winning permanently than any other, and, by the same token, a trade we would probably lose quicker than any other provided we are not able to meet our European competitors and to fight them with their own weapons—**and to fight to win.**

A brief glance at the status of our trade with Latin America (including Mexico, Cuba and the West Indies) will indicate the possibilities:

	Year ended Jan. 31, 1916	Year ended Jan. 31, 1917
Building and fire brick, earthenware, chinaware and tiles	$1,366,000	$2,578,600
Fire and other clays	101,400	154,000
Brick-making machinery, pottery equipment and supplies	78,980	102,520
	$1,546,380	$2,835,120

Going back a few years, let us look into the methods put into practice by the European nations—methods by which the trade of South America, amounting in round figures to one billion of dollars annually, was won—and then take an inventory of ourselves and our facilities in order that we may determine how nearly we can approximate our efforts to those which secured the great bulk of the trade for Germany and Great Britain.

As is well known, the two great competitors of the United States in supplying South America with brick and clay products of all kinds have been Germany and England, whose products and machinery are found in every section of Latin America. Germany and England each took large amounts of Latin-American exports annually; each had (up to the outbreak of the war) very adequate steamship service, with plenty of cargo in both directions; each has extensive banking representation in all the principal trade centers. The principal factor in furthering European trade, however, has been the enormous investments of English and German capital in all parts of the continent, especially in railways and mines, causing a considerable influx of Europeans and heavy importations of German and English goods. The Germans owe a great deal to their enterprising banks, which lend active assistance to schemes of trade promotion; and the facility with which shipments are financed and credits handled through them is one of the greatest German assets in building up and maintaining their immense Latin-American trade. This fact should be carefully noted by our clay products exporters. The most important influence for effecting this result, however—and here is the consideration which should receive the most careful study on the part of our exporters—has been the thorough manner in which the Germans have investigated the special features of each particular Latin-American market, and the pains they have taken to see that their products fitted in with what the people desired and had been accustomed to using. This is a point probably three-fourths of our exporters are paying no attention to, although it is of vital importance.

It is the established custom for young men from Germany who intend to engage in the export trade to spend several years in South America as a part of their commercial education, learning the language and studying the habits of the people. Through them a first-hand and detailed knowledge of the trade is acquired, and the information thus gained is followed closely. With Germany it has never been a case of jumping into a market haphazard and trusting to luck. Can we win trade that way? There are also in Germany many private and semi-official associations devoted especially to the furtherance of the German export trade, and these not only disseminate information as to the special requirements, but frequently subsidize agents to South America and other foreign fields who are constantly making a study of market conditions. In fact, the marvelous co-operation of all German influences in Latin America toward the one object of furthering trade has often been remarked, and it has resulted in the high commercial position of that country in all parts of the South American continent.

A great part of the brick and clay products exporting business of the United States is being done through the export commission houses located in New York, which are primarily the agents of the buyers, filling orders that are sent in and charging a certain commission for the service. But in practice, the business they do ranges from that of the simple buying agent to that of a mercantile house with branches in various countries of the world, while sometimes a house acts as representative of a single large foreign concern. In Latin-

American exports these commission houses generally receive orders from the firms with which they have formed connections or whose standing they have investigated, purchase the goods from American manufacturers and receive and pay for them, which goods are consigned to them and which they forward to the customer entirely on their own responsibility. Of course, as will be seen, the big advantage in dealing with them is that the exporter avoids all trouble in regard to credits, shipping details, packing, claims, etc., and he receives his money promptly. For the United States manufacturer who regards his export trade as merely incidental—a "side issue," so to speak—this is probably the best method to follow in selling brick, clay products and machinery to Latin America. But the firms that wish to build up a real foreign business of their own—such as the Germans and English had in South America prior to the war—will find it absolutely essential to establish direct connections with the market. For accomplishing this object the whole testimony of investigators—and the advice of the Latin-Americans themselves—is to the effect that it is almost imperative for the exporter to come into as close personal relations with the market and the people as his means will permit. Unfortunately, many of our attempts to secure Latin-American business consist simply in sending a lot of catalogs in English (which the average Latin-American cannot read) to a list of names obtained from consuls or directories; they may even follow it up with a straight-from-the-shoulder business-pulling letter in English. All lost; simply a waste of postage and time. It is even worse than that; it creates in the mind of the South American recipient an opinion of our business ideas which directly and indirectly works against trade with us.

The most desirable of all methods, of course, is that of establishing a branch in each important center, with a manager and staff of employes, and a small warehouse for storing stock. The firm's representative could thus watch the demands of the market closely, observe foreign competition, and—most important of all—form close associations with the dealers in brick and allied products. This plan involves heavy expense at the beginning, and is out of the question for the average exporting house. Alternative plans are the working of the market through traveling salesmen, as at home, and the securing of resident agencies, which are houses already established and willing to take on another line. These are called "distributors," and some of them carry as many as fifty lines of goods, ranging from coffins to carpet tacks, Portland cement to fire brick. Another plan in somewhat successful operation is the working of the market through salesmen, agency or branch houses in combination with other exporters in related, but non-competing, lines.

It will not be out of place here to consider for a moment the kind of salesman most suited to place United States clay manufactures and related lines in Latin America so that they will "stay placed." In the first place, he must be of somewhat broader accomplishments than is necessary or required in the United States. The difference has been expressed in the exhortation of the Latin-Americans to "send salesmen, not peddlers"—in other words, to send men who are capable of appreciating other elements in a situation than those relating merely to the profit a dealer may derive from handling a certain kind of brick or tile. In this connection it seems well to emphasize again the point that has been so often made in regard to Latin-American trade, and reiterated by every observer of commercial conditions as of vital importance, no matter what selling method may be adopted. This is: That business in Latin America is largely a matter of friendship between buyer and seller, instead of merely a question of mutual profit between individuals and firms that have no other interest in each other.

Including Cuba, Mexico and the West Indies, the Latin-American export field embraces a population of approximately one hundred millions of people.

The United States is today in a better position than was ever Germany, France or England to win and permanently hold the trade.

Will we do it?

THE BRICK CASED FURNACE.

The heating furnace for the home is usually made of cast iron or steel set up on a brick or concrete foundation, and so far about the only clay products entering are linings for the fire bowl. Generally the outer or hot air casing around these furnaces is made of galvanized metal. Occasionally one encounters a furnace with a brick well outer casing, that is, a brick casing built around all the furnace except the door and far enough from it to leave what is called the hot air space, thus taking the place of the galvanized metal casing. There really ought to be more of this and here is a place that the clayworking industry should be able to do some good mission work. The brick casing around the furnace in the basement, if properly made, though costing a little more primarily, would not only be a permanent casing and last forever, but it affords a splendid fire protection. The brick wall or casing is the best fire protection known, so when the furnace is properly cased in with brick there is a fire protection here that of itself is worth the cost of doing the brick work. A little investigation into this subject has some mission work on the part of the brick and hollow tile industry should result in developing a little extra business that will be good for the householders as well as the clayworking industries.

FOOD FACTS AND FOOLISHNESS.

Practically every man, woman and child knows that there is a great administration campaign on for the conservation of food. Perhaps nearly every home has received one of the Hoover cards with rules and suggestions about food economy printed thereon.

There is one important fact we can get out of all this, and that is the need for thrift and economy in connection with the food supply. No one capable of comprehending the situation will question this. There is room to question many of the ideas advanced and to deplore some of the hurrah that has been instituted in connection with it.

There never was a propaganda that did not have its attendant foolish ideas as well as important facts, and we could hardly expect the food situation to escape this. Too often, too many people are trying to tell the public what to do and how to do it, while the public itself is in the main duly impressed with the situation and fully competent to devise its own ways and means to meet it.

There is some danger that in the matter of foods, as happened in connection with coal last spring, too much excitement will lead many into the practice of individual hoarding, which will make the situation worse instead of better. Quite a lot of the early scramble for coal was due to people becoming frightened and laying in their winter supply early last spring, when if they had kept calm and waited a couple of months they could have obtained coal easier, for less money, and there would never have been so much tension in the coal situation.

We may have some of this in the food situation yet. Meantime, however, there is evidence that an effective check will be put on efforts to corner foodstuff and to speculate in it, and this will have a wholesome effect.

The most important thought we get out of the situation is this—that every family should give earnest attention to the matter of feeding itself sanely and rationally to the matter in reducing waste of food, and to the matter of economy in food purchases by seeking for such wholesome foods as are most plentiful and to be had at comparatively low prices. In the end we will find compensation through better understanding of various food values, and developing the habit of thoughtful attention to the subject of economy and conservation in foodstuffs.

A JOURNEY TO THE PLANT OF THE INTERNATIONAL CLAY MACHINERY CO.

THE OTHER day we ran over to Dayton, the home of the Wright Brothers, National Cash Register, and Clayworking Machinery, to get a close-up of the things that go to make up "International Service."

We saw a most thoroughly equipped factory, so full of orders of clayworking machinery, that certain departments were operating two shifts a day.

International's main factory buildings are of brick and steel with roofing tile roofs, a true exemplification of clay products, and from what we could see, there were no factories in the "City of a Thousand Factories," built with greater substantiability than International's.

The main building is 300 feet long, is devoted entirely to machine operations, the assembly of International equipment, and also houses the woodworking department, International's pattern shop, the engineering department, as well as the factory offices.

International Plant Seen from the Office Building.

We also were shown a well equipped foundry, where all of International's castings are turned out.

The foundry foreman was not backward in commenting on the clean-cut castings, which were being continually wheeled into the machine shop.

We saw various styles of iron mixtures, some we were told made from a new formula, giving extreme hardness, as well as toughness. These particular mixtures were to be used in the manufacture of dry pan mullers, wearing plates, auger mechanisms, etc.

A new building has been added for sheet steel work, dryer car manufacture, gas producer building, etc.

Hundreds of cars, structural steel and cast iron, were in the process of manufacture, as well as soft mud rack cars, and special cars of several varieties.

About a dozen producer shells were in the process of formation, or completed, and the hammer of the air riveters on two large gas flues for International's Gas Producer Dryer was deafening.

The last building visited contains International's Testing Laboratory, completely fitted up for the physical testing of clays.

One of the gas kilns was burning a silica brick test, the Thwing pyrometers used registering nearly 2700°F.

Upon our inquiry as to what "International Service" meant to the clayworker, we were advised:

"It means just what it says—a real service to every clayworker doing business with International.

"We are building a new line of wirecut machinery of great efficiency, are promoting an improved standard line of soft mud equipment, the well known Berg Press, and are especially pushing the use of producer gas in drying and continuous kilns, although we are in position to furnish equipment for waste heat dryers, and coal fired round and rectangular kilns.

We are meeting every clayworker on a fifty-fifty basis, and do not consider that our obligation ceases when an order is signed.

Every customer must be satisfied. We are doing business that way and no other."

Upon our inquiry as to who comprised the International Clay Machinery Co., we were told that it was a corporation under the laws of Maine, the entire capital stock being owned by Boston people.

The personal of this concern, the youngest member of the clayworking machinery fraternity, will be most interesting to all clayworkers. The President, Mr. S. W. Reynolds of Boston, Mass., is well known in eastern financial circles, at one time being president of the Mexican Central Railroad, and now president of the Teziutlan Copper Co., as well as associated with other financial institutions.

The General Manager, Mr. Mortimer Silverman, has been recently connected with the financing and the management of various public service and industrial corporations. Mr. Silverman was for many years connected with various engineering and industrial enterprises, being a graduate of Boston Tech.

The Sales Manager, Mr. R. H. McElroy, former sales promotion manager of the Cadillac Motor Car Co., Detroit, Mich., a graduate in Ceramics of Ohio State University, had been in various capacities in the clayworking business for six or seven years, before entering motor car work.

The Chief Engineer, Mr. Jos. D. Cite, a former engineer in the French army, was at one time connected with Thos. A. Edison, and has for many years been applying his talent to power work and clayworking.

International Foundry, Car and Sheet Metal Shops.

The General Superintendent, Mr. F. P. Johnson, formerly associated with the Barney & Smith Car Co., of Dayton, Ohio, is a man of much mechanical experience, not only in clayworking, but in many other industries.

International's executives believe that the clay machinery and equipment business has been run too much as a "father and son" proposition. They, therefore, have injected new blood in the engineering and designing ends of the industry, believing that new machinery ideas, as well as more perfect equipment is necessary.

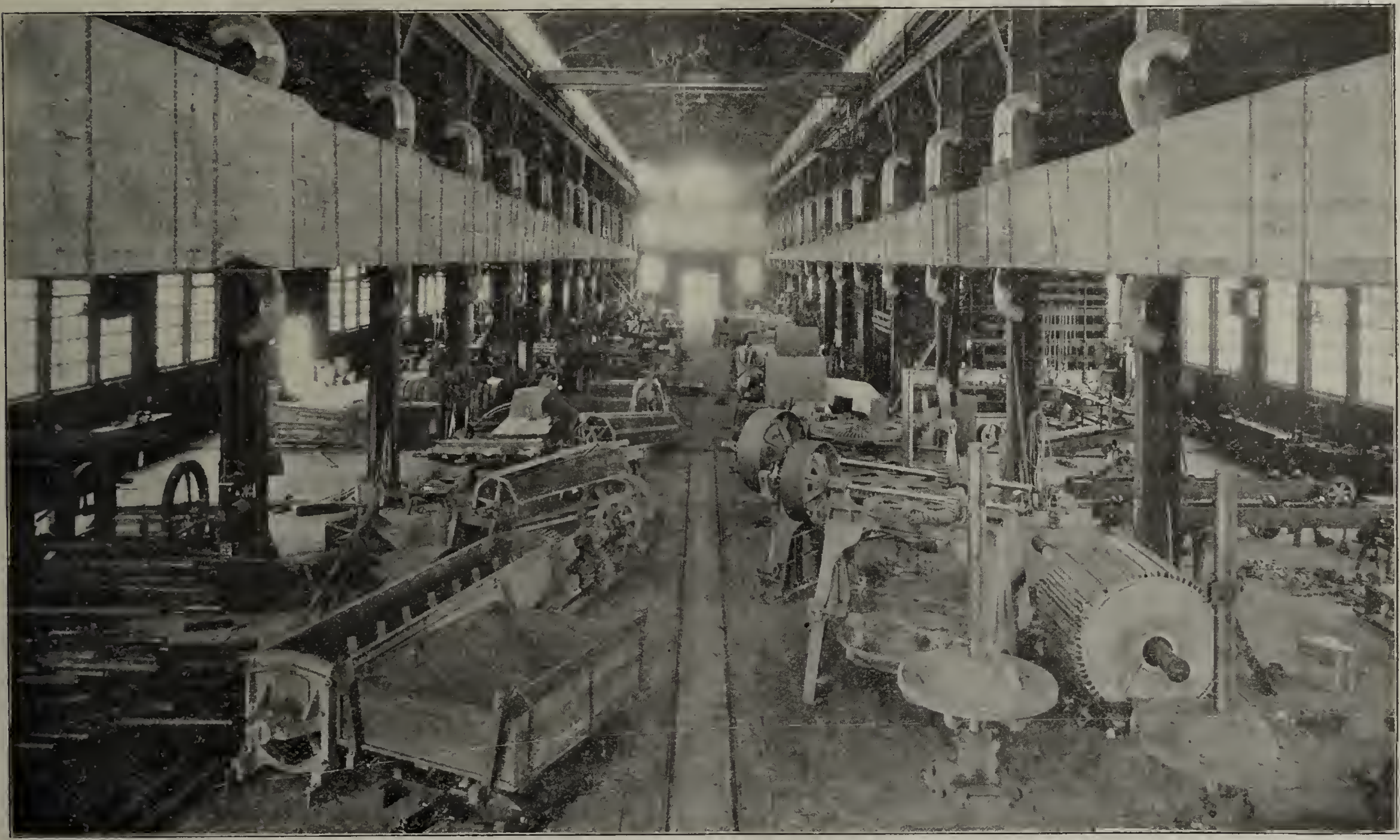
The new concern is doing a business on a basis that the confidence of their customers is International's greatest asset.

Messrs. Silverman and McElroy assured us that even though the sales campaign of the new company really did not start until January 1, 1917, their shop is running full on clayworking machinery alone, with orders for several months in advance.

International has recently finished up a contract on 4.7 high explosive shells for the U. S. Government, yet General Manager Silverman states that with the present prosperity in the clay industry bidding to continue, it is very doubtful if they will be in position to take up any new shell work.

BRICK AND TILE PRODUCTS SHOW LARGE INCREASE.

LARGE INCREASES IN THE VALUE OF BRICK and tile made in the United States in 1916 are reported to the United States Geological Survey, Department of the Interior. The total output amounted to $159,042,849, an increase of $33,248,005, or more than 26 per cent. over the figures for 1915. The value of every variety of product classified by the Geological Survey except two was increased. Common brick, the product of greatest value, the output of which has been declining in recent years, showed a large increase in both quantity and value. There were 7,394,202,000 brick reported for 1916, valued at $49,357,411, or $6.68 per thousand, an increase in quantity of 543,103,000 brick and in value of $7,212,119, or 17 per cent. Fire brick, valued at $30,806,129, increased $11,966,198, or 64 per cent. Sewer pipe, which showed a large decrease in 1915, rallied in 1916, and showed a large increase. Its value in 1916 was $13,577,006, an increase of $2,317,657, or 21 per cent. Vitrified brick or block remained practically stationary, being valued at $12,236,890, an increase of only $5,991 over 1915. The front brick industry showed a considerable gain, its output being valued at $11,464,614, an increase of $1,929,078, or 20 per cent. Draintile and architectural terra cotta also showed large increase over 1915. Tile (not drain) valued at $6,475,464—consisting of roofing tile ($914,240), floor tile ($1,438,231), ceramic mosaic tile ($1,308,861), faience tile ($814,077), and wall tile ($2, 000,055)—showed a gain of $1,289,409, or 25 per cent.



Assembly Floor, International Machine Shop.

Brick and tile products are classified naturally into three divisions, (1) structural materials, (2) engineering and refractory products, and (3) miscellaneous wares. The first, structural materials, including building brick of all kinds, terra cotta, fireproofing, and tile (not drain) was valued at $84,643,252 in 1916, an increase of $14,234,136, or 20 per cent., over 1915; the second, engineering and refractory products, consisting of vitrified draintile (used principally for paving), sewer pipe, stove lining and fire brick, were valued at $67,305,448, an increase of $15,636,664, or 30 per cent., over 1915; the third, miscellaneous wares, consisting of such products as adobes, assay supplies, burnt clay ballast, chemical brick and tile, chimney pipes, tops, conduits, glass house pots and supplies, retorts, sewer block, and wall coping, were valued at $7,094,149, an increase of $3,377,205, or 91 per cent. over 1915. Pennsylvania was the leading state in the production of brick and tile, reporting these wares to the value of $29,630,563, or 19 per cent. of the total, an increase of $8,732,281 over 1915. Pennsylvania's principal brick and tile products in 1916 was fire brick, valued at $15,200,354, which was nearly 50 per cent. of the total value of fire brick for the entire country. This was an increase of $6,111,404 over 1915. Ohio ranked second, with products valued at $25,506,344, or 16 per cent. of the total, an increase of $4,596,502. Ohio's principal brick and tile product in 1916 was sewer pipe, valued at $5,132,810, an increase of $1,413,020, over 1915. Illinois was third, with products valued at $16,507,845, an increase of $2,664,799 over 1915. Illinois' principal brick and tile product in 1916 was common brick, of which it was the leading producer, its output being valued at $6,738,152, a decrease of $132,838 from 1915. New Jersey was fourth and New York fifth, with products valued at $9,749,524, and $8,410,340, respectively, both states showing large increase in value compared with 1915.

A SKETCH OF EARLY SEWER PIPE MANUFACTURED IN ENGLAND AND WALES AND THE UNITED STATES.

BY JAMES WOODS, SR.

IN THE YEAR 1850 my father, Thomas Woods, was manager for a Thomas Spencer, at Prescot, nine miles from Liverpool, England. The body of some pipes was made on the pug mill principle, and others on the rack and pinion, and still others on the screw principle, the socket being put on after to complete the pipe.

In looking for an improved method, my father and Thomas Spencer invented and patented the Spencer steam pipe press, which made the pipe complete. The first presses were made at St. Helens, two miles from Prescot, at Robinson & Cook's foundry. Then in 1851 one of the presses was sent to London for the World's Fair. My father set it up and made sewer pipe in the Exposition building, and, although I was only five years old, I remember his return home. A short time after my father sold his interest in the patent to Thomas Spencer. He then left him and made a three-year engagement with the firm of Hatkins & Hayes, of Liverpool, and took one of the pipe presses into North Wales and started a works at a place called Llwynenion, four miles from Rexham. It was here I commenced work at the age of seven, as I preferred work to school.

My two older brothers, a woman and myself made 3 and 4-inch pipe on a hand machine called the White-Head rack and pinion, built for making drainage pipe. It made the body of the pipe so that it was cut off in 2-foot lengths. We then put the socket on, and afterward they were put on a regular potter's wheel, which it was my duty to turn. We would make a batch of clay, the size to suit, on a bench between two wooden strips, on a piece of leather or cloth, then pick it up and put it around the pipe, press it tight and finish it with a piece of wood the shape of the socket. Then, after they were hard enough, we had a drum with a socket head on, an iron handle at one end, and a piece of ¾-inch iron on the other, and had two pieces fastened to the bench and two pieces for these to fit into, turning with one hand and finishing with the other. The reason for making the small pipe by hand was to give more time for the large pipe on the press.

The clay used was very rough and yellow. It was first blunged into slip, then run onto slip pans—made of brick—12x14 feet wide and about 30 feet long. A furnace was at one end and a stack at the other. The slip was run onto the pans about 1 foot thick, and to it was added enough fine sieve fire clay to stiffen it; after it was real hot it was turned over once or twice, then wheeled into the clay shed and put in large piles. After three or four days it was pugged and put in other piles, then tramped down solid by three or four men, with their heels, then it was ready to put on the press stage.

The way they ground the fire clay in Wales was by having large stone wheels, about 6 feet in diameter, that rotated in a circle of about 14 feet; scrapers were attached to the framework, which went around with the wheel to keep the clay in the track. After it was ground fine, it was conveyed to the elevator by these scrapers.

If you can refer back fifteen years or more in clay work, you will find a good description of the form of the Spencer press. There was one advertised, manufactured by the firm of Stevenson Bros., of Wellsville, Ohio. I know of two presses that were imported and set up near Wellsville about 1880.

The first Spencer press was not perfect, although it made a perfect pipe; but it was not long before we had improvements, both in dies and handling the pipe after it was made. At first we had one socket head, made of wood and shod with brass; the die that formed the outside of the socket was in halves and opened and closed in slides, the socket head being put in and taken out after and before each socket was made. A drum with a loose socket head was slipped up the drum by a man who guided it down the drum. The pipe was cut with a horse-nail driven through a piece of wood, just the thickness of the pipe, the wood forming the hand-hold. All pipe over 6 inches was turned over at the machine by men and carried on boards to dry. They were made a little longer so they could be straightened and cut to length, when turned over to finish.

I remember we had much trouble with the pipes cracking, for we had no steam pipes overhead, but flues under the floor. When the pipe was sufficiently dry, we had a drum which had a socket head fast at one end, and a piece of iron about 10 inches long on the other end. The drum was placed in the pipe, the socket head placed on the floor, and the other would fit in another piece of iron, called the goose-neck, which was fastened to the bench. The pipe was placed on a slant so that it was turned with the knee, and the body of the pipe polished with a palate knife, which had a long, thin blade, so that it would bend around the pipe, then it was cut into lengths and the socket finished. After we got steam overhead we did not have so much trouble with pipe cracking.

The last place I worked in England was for Mr. J. W. Warmsley, of Rainford, near St. Helens. My brother was foreman here for over three years, and I ran the press.

We had the table and balance weights to receive the pipe, then it went to a platform and from there to a finishing table. All we had to do was to push it onto the finishing wheel; after it was finished it was placed on a truck with a cradle on, this way of turning being better than by hand. At this place we not only had improvements in presses and handling the pipe, but we also had dry and wet pans, similar to those advertised in The Clay-Worker to-day; there were some minor differences, but the principle was the same.

It was in the fall of 1867 that my brother decided to come to America, so, accompanied by my cousin, he came, and when they got to Philadelphia they saw some pipe for sale, and upon inquiring learned that it was made in the pine woods of New Jersey, but that the proprietors lived in the city. I forget the name of the firm, but they were Quakers, so they went to see them, making arrangements to go to the works, which were twenty miles through the woods from Pemberton, N. J.

After traveling sixteen miles they came to a place on the Raritan-Delaware Bay Railroad called Woodmansee, and, setting out again, with four miles ahead of them, they finally arrived at the works. Here they found they had much trouble with the ware going through the kiln, but this trouble was done away with by my brother changing the kilns to the oven down-draft.

They worked here for the winter, and in the spring a Captain Townsend had my brother to start a works on his land, having had 1,675 acres all in one piece, with the railroad running through it, making it possible for him to obtain the same kind of clay as they had used the previous winter.

The Captain built them a house and the railroad company built a small station, calling it Wheatland. In June, 1868, my brother returned to England, bringing his wife and two children back with him, and it was with them I came.

We landed in New York July 23, 1868, on Saturday; stayed in New York until Monday; left by boat for Port Monmouth, N. J.; took the car to Manchester, and got there by noon, to learn that there was no train until Wednesday, and eleven miles still ahead of us. But a kind railroad official came to our rescue and lent us a handcar, and on this we worked our passage home. There was only one train a week from Manchester to Chemung at that time.

We had to go three miles to get our mail, and if we wanted to chat with our neighbor we had to walk a mile and a half. But the abundant flocks of mosquitoes and fireflies entertained during the summer, and sometimes we saw bears and deer.

The Captain sent to England for a Whitehead hand machine. We set it up, built the shed and kiln and began making pipe. The Captain's idea was to show that he had the material for making the pipe, the railroad convenience, and all that he needed was the capital; but we left the Captain in the spring and went to Philadelphia. Here we found only two sewer pipe works, one on the Germantown road, the other at Falling Springs, on the Schuylkill river, the latter being rebuilt at the time, after having been burnt down.

Both factories made the pipe in 3-foot lengths; they made them of fire clay and dipped them in Albany slip to give them the glaze.

After remaining in Philadelphia for three months, we went to Pittsburgh, and upon inquiring learned of some pipe being made at Sloan's Station, now the city of Toronto, Ohio, where so much paving brick is made.

When we arrived there we found a small village and the sewer pipe works of Carlyle & MacFadden. They made the body and the socket on separate machines and then put them together. There was another sewer pipe works on the other side of the river, in New Cumberland, W. Va., but this was not in operation. Those were all the sewer pipe works we could learn of from Philadelphia to St. Louis, but there were two large works being built, one at McCoy's Station, two miles from Toronto, the other at Walker's, just below East Liverpool, Ohio. They were both installing steam presses.

An Englishman named Wm. Wassel was superintendent for N. U. Walker, at Walker's, having come from St. Louis to take the position. It was then July 1, 1869, and Wm. Wassel had brought the idea of the Spencer press from England. He had the patterns made expressly to his order and had them cast in Pittsburgh, the cylinders being put together much as they are now.

My brother got work as burner at Toronto and I went with N. U. Walker, to run the press. The ware was burned in up and down-draft kilns, and salt glazed.

We just stayed West nine months and then came back East to Pittston, Pa., where we had a relative who had been working in connection with the coal mines for several years, and he thought it would be a good place for a sewer pipe works.

We leased a building, imported a Spencer press machine from England and put in a dry and wet pan, and it was here my brother and I conceived the idea of the hollow building block. After we got fairly started we made building blocks for two houses, which are in as good condition now as when built, forty-five years ago, one being not 500 feet from where I now reside.

In 1874 the firm of Nelson, in New York, handled most all of the sewer pipe of the large quantity imported from Scotland. He wanted to take all we could make, but we could not furnish them at that, on account of scarcity of room.

We were here six or eight years, then my brother went back to England, and I came back to N. U. Walker again. I found great progress had been made in all branches of clay work. At this time, about 1879 or 1880, there were two firms making steam pipe presses—the Vaughn and the Barker Machine Companies, one at Tioga Falls, the other at Akron, Ohio.

In my opinion it was the English and the Scotch who did the pioneering work in the developing of the sewer pipe business in the United States, and I will name some of the pioneers in this work. Commencing with the year 1869 at Toronto, Ohio, there were Carlyle & MacFadden, both Scotchmen; at McCoy's Station was a Mr. Ford, an Englishman, as manager; at Wellsville were Jones & Lamon, in the terra cotta business, and a little later in the sewer pipe industry. Those two men had been with N. U. Walker, and had just left him when I got there. N. U. Walker had been in the fire brick and terra cotta business some years, and at that time there were two Englishmen working for Walker at pressing. Wm. Wassel was manager for building a new plant for Walker. There was also a Wm. Ward and George Spencer in the sewer pipe business.

Before I left Walker in 1870 to come to Pittston, Mr. Wassel had left there and gone to Columbus, Ohio, to establish a plant, and Wm. Ward succeeded as manager. When I returned to Walker again, after having been in Pittston eight years, I found two other Englishmen, a George Dickinson and Walter Adamson, who went to St. Louis in 1882, and in the spring of 1883 my brother and I left Walker to run a brickyard which he had leased from Calvin Fletcher, of Spencer, Ind., where he carried on the business and I went to St. Louis. Here I found three large works, the Laclede works, the Evans & Howard, at Cheltenhan, and one at Seventeenth street. Here I found my old friends, Wassel, Dickinson, Adamson and several other Englishmen. Wassel was in the paving brick business, Dickinson manager for the Laclede works, and Adamson was running one of the two steam presses. There I secured employment under Dickinson in the terra cotta department, until the fall of 1884, when I took charge of the terra cotta department of the Bordal (Ill.) Sewer Pipe Works, which was managed and partly owned by a Mr. Abraham Horlicks, of Manchester, England. He had been in the brick and tile business many years prior to entering into the sewer pipe business. It was here I met my old friend, Wm. Ward, who had just left Bardolph to start a sewer pipe works at Macome, four miles distant, and after spending three years at Bardolph my health failed, and I went back to Spencer, Ind., to my brother. That ended my sewer pipe career.

SHORTAGE OF LABOR BECOMING MORE ACUTE—DYNAMITE BEING USED—LABOR SAVERS IN DEMAND.

THE WORLD to-day is in need of men. Not alone for war purposes, but for business and industrial conditions. Millions of mechanics and laborers are required to run the world's machinery. With all the available men of the fighting European countries enlisted in military services and search being made for volunteers—in fact, a draft law in force in our country—means are being sought whereby work can be done with less men. In farming and industrial work dynamite is being used as a substitute.

Really, without explosives we would be in a bad predicament. The extent to which high explosives can be used is certainly amazing. They are used practically all over the world for subsoiling, tree planting and land draining.

Fruit growers are high in their praise of dynamite. It prepares the ground for planting orchards, so that the roots of the trees may reach far into the loosened earth and thrive properly. Rain sinks into the mellowed subsoil and there serves its nourishing purpose for weeks after the top soil has become dry.

Dynamite is extensively used as a labor-saver for digging trenches, canals and ditches. In road building, especially where heavy grades are to be cut down, explosives do the work of many men.

Columns could be written on the employment of explosives for business purposes and its aid to all great constructive work. But, briefly, it is a labor-saver when used for the following purposes, in addition to those previously mentioned: Draining swamps, blasting holes for telegraph and telephone line poles, straightening streams by blasting new channels, wrecking old buildings, bridge piers and stone walls, blowing down clay in brickyards, breaking up frozen ore on ground or in open cars, and loosening ground for sewer excavations. While this last use may be considered dangerous, it is being accomplished without danger to the public or to underground pipes.

Explosives are known to many only as instruments of destruction, hence their great labor-saving qualities are a revelation.

When the great world conflict stops the explosives business will not be materially reduced. The world, in peace, will be in a constructive mood and labor-saving dynamite will be used extensively. Besides, millions of acres of European battlefields must be converted into productive farm and fruit fields, and the already great use of this agency for land clearing and drainage in this hemisphere will continuously increase.

OFFERS IMPROVED CLAY DRYER THAT COSTS LESS AND SAVES FUEL.

FIRST COST LESS, and saves 30 to 40 percent in fuel consumption. The old saying that "necessity is the mother of invention" has again proven to be a trite saying.

The inventor, W. W. Swengel, of Bloomsburg, Pa., a practical brick manufacturer, saw the necessity for a clay dryer that would cost less to install than the old type, and at the same time be more economical in the cost of its operation, which could be placed within reach of the average brick manufacturer.

W. W. Swengel.

The old type dryer which has been used in the past, is not only very inefficient in its operation, but has been costly to install, owing to the amount of ironwork required in its construction and large buildings needed to house same.

Owing to the nature of the construction and to the method in which the hot air is applied to the improved type, the cylinders need not be as large, and it is claimed that the clay will not adhere to cylinders. The air and gases are admitted to machine beneath lower cylinder, encircling around the cylinders in its upward movement to fan, and then are forced through the three cylinders. Each cylinder receiving dry hot air, and the moisture from each cylinder likewise is carried away without going through the second or third cylinder, and in addition, by this method the heat units are held twice as long as the old type, resulting in greater efficiency, increasing its drying capacity.

It will also be noted that the speed of air going through each cylinder, will be only one-third of that of the old type, and therefore, the exhaust gases will not carry off dust as quickly as has been the case in the former type.

The cylinder of the old type is exposed to the cold air, not being protected, while the new type is incased within brick walls, which effects a big saving in radiation losses.

Engineers who have examined the plans, are very enthusiastic in their praise of the improved type dryer, and up to the present time, without any publicity having been given it, Mr. Swengel states he has received a number of inquiries for machines, which goes to show that there is a large field for the machine.

The drying of clay is a subject upon which very little has been written, and yet is a very important subject. No doubt but that there are many plants that could use a clay dryer to a good advantage. A large portion of plants use soft clay or overburden in their mix, which requires an excess of power, labor and repairs in order to grind and screen the damp material. One of the greatest advantages to be gained by drying the clay would be that the plant would have a maximum production the entire year, which would enable the plant to cut down the cost of manufacturing, in addition to the profit to be gained on the extra number brick manufactured.

The subject of drying and the preparation of clays promises to become a very live subject, and to most manufacturers should be a question of great importance, and would suggest that anyone interested, take the matter up with Mr. Swengel, who has made a special study in a practical way of this part of the process of manufacturing clay or shale products.

EVERY MAN ON THE JOB.

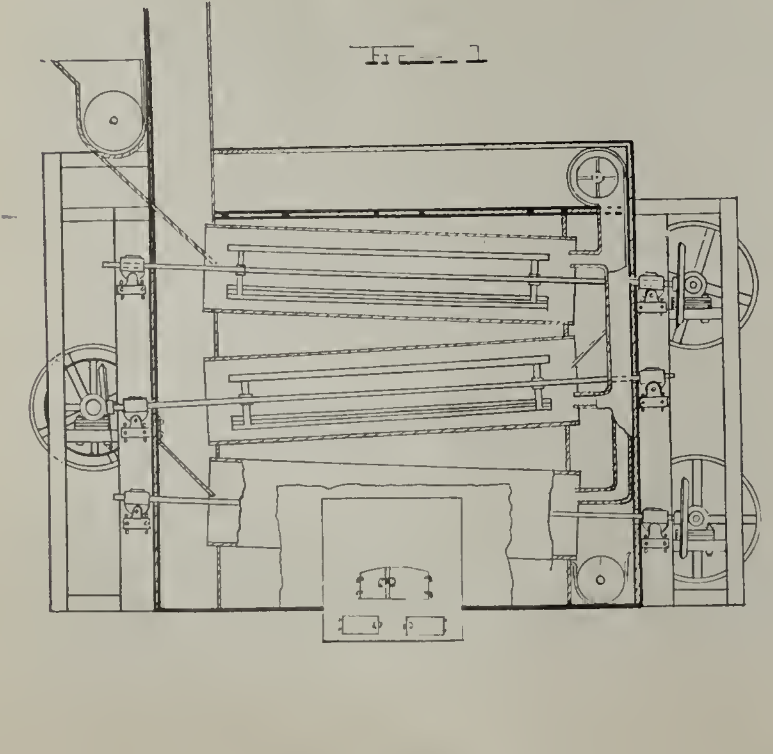
Every man's duty is the same. Your job is your duty. Your neighbor's job is his duty. Each of us can do his part most effectively by redoubling present endeavors at whatever his regular occupation may be.

If we are railroading, let us railroad for all we are worth. If we are farmers, let us farm more. If we are mining, let us mine as never before. Let us do the same if making shoes, making clothes, building houses, building factories, warehouses, skyscrapers, roads or whatever it may be.

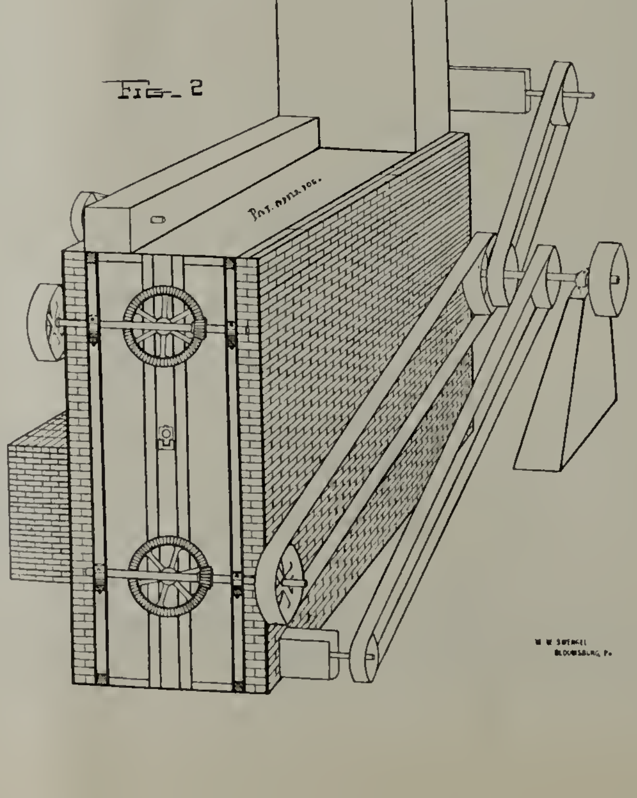
Our entering into war need not and should not mean a curtailment in road construction and building operations. War does not mean that everybody should forget business and live a life of gloom. Let everyone do his bit along lines for which he is best suited. Let the world go on as before, work harder, play harder and the war will end sooner.

Let both public and private useful construction proceed. Production and handling of building materials and public and private construction work are fundamental industries of the country. The country is prosperous. Building investors should not hesitate to go ahead with their plans. Railroads should spare no effort to supply the building industry with the cars needed to transport materials. Government, state, country and municipal authorities should encourage the continuance of all kinds of building. Road and street improvements in particular should go on unabated. Bad roads are factors of first importance in the present high cost of food-

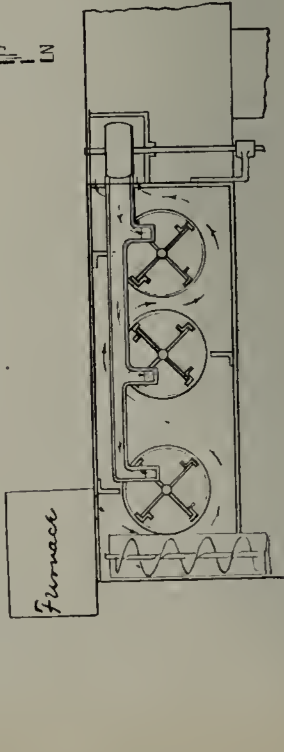
FIG—1



FIG—2



FIG—3



essential. Let all lend a hand towards getting roads improved.

Contractors should make a careful study of conditions that they may encounter and lay plans accordingly. All work possible should be done by labor-saving devices. What may seem a heavy initial expenditure for equipment will very probably prove to be a wise investment before the contract is completed. It is worse than folly to use slow, costly methods.

Neither Government regulations nor railroad restrictions should be imposed necessarily to interfere with the shipping of building supplies. If any action is taken which results in the prostration of so fundamentally important industries, there is real danger of a surplus of unemployed labor, a surplus of railroad cars and a crippling of business that will seriously embarrass the Government in financing the war.

Written for the Clay-Worker.

BRICK NEWS FROM THE TWIN CITIES AND THE NORTHWEST.

The BUILDING SEASON in the Northwest for several months, has been rather below the average, due to the rapidly advancing costs of materials, the increased cost of labor and its scarcity, and to the uncertainty which the public feels, regarding the permanence of high prices. The falling off is more pronounced in the larger cities than in the interior, and indicates the effect of conditions upon industrial lines, as compared with agricultural lines. There is a need for additional building, and the people of the Northwest, as a whole, have more money than ever, but they must become convinced that the present high range of prices is likely to continue for some time, before they will accept the new order of things.

So far as building is concerned, the probabilities are that it will be better to build in the near future than later, for the longer a resumption of building holds off, the heavier will be the pressure when the boom starts. There will be a steadily increasing volume of building needed, to be provided in a limited length of time. The scarcity of labor will not be overcome for with the draft for soldiers in progress, there will be still more men taken from various walks of life, including building mechanics. Prices of steel seem to be well established for many months to come, and this should furnish support for other items in building. On brick, prices have been discouragingly low for a long time, and have only of recent weeks been moved up to cover increased costs in manufacture and handling.

Brick manufacturers need to take close account of costs, in figuring their prices, for everything in the way of supplies has advanced, and if care is not taken, the costs will be in advance of the raises which have been charged. The time of cheap fuel is past, and the same thing applies to other goods and supplies. Brickmakers who do not give this matter careful consideration are taking chances of figuring on too narrow a margin, even with an advance on former costs.

The Twin Cities have a fair number of good-sized buildings in view. The largest is the St. Paul Union Depot which, after many years, has gone to the stage of being under contract and work started clearing the site. The work has been let to the George J. Grant Construction Company, of St. Paul, one of the best known firms of the city. The building will cost about $3,000,000 while track work and changes will run several million more. While the exterior of the building will be of stone, there will, of course, be a great deal of brick and tile in its construction.

In Minneapolis the Y. M. C. A. has been taking bids for the construction of a fine new building, to cost $500,000 or more. This is the parent unit and is to be followed in time by half a dozen branch buildings located at strategic points throughout the city.

The Builders Exchange, of Minneapolis, has work started for a twelve-story office and exchange building in the heart of the club district. The Minneapolis Exchange is the first exchange anywhere in the country to undertake the erection of a building of its own, and the work is up to the fourth story. The building will accommodate building material exhibits for a number of lines. A number of the prominent brick concerns will have quarters in the building.

The Northwest Face Brick Association is gradually working out its policies for helping bring the brick business to a better level, as well as eliminate some of the expensive and unnecessary things which have been so costly in the past. The members are well pleased with the work of the association and see better things in store for the whole trade as a result of the organization's efforts.

The Minnesota state fair had the usual number of exhibits devoted to brick and tile at its showing, the first week of this month. The interest in conservation makes the value of brick and tile construction more apparent to visitors, especially from the country. With the offerings of plans for moderate priced brick houses by the Northwestern Clay Association, there is a larger interest in brick dwelling construction than ever before. The construction of silos has been urged strongly for several seasons, and here again, radial block or brick construction has a standing which is not approached by any other form of material. Great interest was shown in the tile and brick exhibts.

T. WIN.

NEW JERSEY PLANT DAMAGED BY FIRE.

For the third time in a month the Lamberton plant of the Maddock Pottery Company, of Trenton, N. J., was visited by fire and damaged to the extent of $5,000. There is now absolutely no doubt in the minds of the company and the police that the fires have been of incendiary origin, but no reason is known. The company has never had any labor troubles, and while it has had Government orders, and has been making ware for the army and navy for years, the Government ware was in none of the buildings fired.

WAR MAY COST GERMANY DOLL INDUSTRY MONOPOLY.

One of Germany's greatest industries—in which she has had a virtual monopoly for years—will soon be lost to the German people unless the war is speedily settled, according to Ernest Reinhart, formerly of Thuringen, Germany. Mr. Reinhart has just established a big plant at East Liverpool, Ohio, for the manufacture of baby doll heads, a new industry in this country. His plant in Thuringen, which was put out of business by the war, turned out 800,000 baby doll heads weekly. He expects to equal that output with his East Liverpool plant. A five-kiln pottery has been leased and is now in full operation. Extensive additions are to be made.

POOR ARGUMENTS.

Whatever real facts may develop out of the experiment prohibiting the manufacture of whiskey during the war period we will find and understand in time. Meantime some of the arguments advanced by the whiskey interests are not merely tommyrot but are actually so offensive as to do actual harm to the cause they are trying to forward. For example, they try to make a boost for whiskey out of the claim that men like Grant, Washington, Jackson and Jefferson drank. It is not only poor business, but it is an unwholesome use of revered names.

CHICAGO CEMENT SHOW.

We learn from Secretary B. S. Smith, of the Cement Products Exhibition Company, that it has been decided, in view of existing conditions, not to hold the usual Chicago Annual Cement Show next winter.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Members American Ceramic Society, Attention!

Editor The Clay-Worker:

Through the efforts of its membership committee, the American Ceramic Society will be represented at the Third National Exposition of Chemical Industries, Grand Central Palace, New York City, week of September 24, 1917. A representative of the society will be stationed at the headquarters' booth assigned to the society by the exposition management.

The American Ceramic Society has been duly recognized by being provided a place, on an equal footing with the other great and numerically stronger national technical societies, on the excellent exposition program. An informal meeting of the society is scheduled for Friday afternoon, September 28, at 3:30 o'clock, in the Grand Central Palace.

Do not miss this double opportunity of visiting the exposition and of promoting the interests of the society by your attendance.

Do not fail to register at the A. C. S. headquarters. Try to be there on Friday.

MEMBERSHIP COMMITTEE,

Wooster, Mass. Ross C. Purdy, Chairman.

A Tribute to the Late Howard Valentine.

Editor The Clay-Worker:

The truth of the old saying that "Death loves a shining mark," is again illustrated in the passing from this world at 2 a. m., this day, of Howard Valentine, of Woodbridge, N. J. Mr. Valentine has been a member of the firm of R. N. & H. Valentine for about forty years, and up to last November, when taken ill with pneumonia, had enjoyed good health, but never recovered sufficiently to resume business, although up to the very last his friends hoped he would recover. He was a noble, lovable man and will be greatly missed.

Last December he was elected president of the New Jersey Clayworkers' Association and although he at once resigned on account of ill health, his resignation was not acted on until June, and then only because the United States government had requisitioned the services of the vice president for the period of the war. He leaves a widow but no children.

CHARLES A. BLOOMFIELD.

Metuchen, N. J., Sept. 5, 1917.

Observations of an Experienced Brickmaker.

Editor of The Clay-Worker:

It has occurred to me that some of my observations in visiting different plants will be of interest to Clay-Worker readers:

In working on and visiting different plants I find one weak spot in the great majority of plants, is in the prepared clay storage room, between the crushing or grinding machinery and the auger machine. There should be, in my judgment, sufficient storage, so that an accident to either would not hinder the operation of the other. Then the clay from such storage bin should be fed with an automatic machine to give an even supply of clay to the auger at all times, which not only gives an even production but makes the tempering a simple matter. While quite a large number of plants have the automatic feeding device, the storage bins are so small that half an hour's shutdown of the crushing plant closes down the auger as well. This would not occur with sufficient storage. One often finds large rough clay bins, but it seems to me the ground clay bins are much more important. The best arrangement of this kind that has ever been my pleasure to see is on Mr. Eben Rodger's plant, at Alton, Ill.

Not only from the points mentioned above is it an advantage, but the mixture is much better. As well as the aging or sweating the clay receives adds to the quality of wares to an extent almost beyond belief of one who has not used such clay.

While the old soak-pit had its disadvantages, it also had advantages, in better mixture of the clay.

It seems to me that a visit from a first class efficiency man, and a little heed given to what such a one would advise in these days of scarce and high priced labor, would save the average clay manufacturer many thousands of dollars. Next best is a visit paid to one's neighbor and adopting some of the little things he has picked up from just such a visit he made to some other neighbor. One gets so used to seeing things go along in a certain rut (self-made) that we don't notice where a small change might save a man or two on the pay roll, or make the product better. Should this escape the waste basket, may continue at some later time.

J. E. MECUSKER.

What Are You Going to Do About It?

Editor Clay-Worker:

That there has been quite a slowing down in building operations over the whole country is quite evident. The question for the clayworking industry is, what are you going to do about it? Are you going to accept it as a condition that can't be helped and let it go at that, or will you join the ranks of those who are putting forth effort to improve the situation and promote renewed activity in building?

Under the head line of "Not Business As Usual," the Saturday Evening Post in a recent issue takes note of the fact that building operations in the United States are declining, and says that one can predict quite confidently that a progressive decline will occur as war continues. It takes the position that there must be contraction somewhere and that it might as well be in building operations as anywhere else. One significant paragraph in the editorial contains this:

"When a building or a plant deteriorates, a past accumulation is being used up and a lien on the future for replacements is being created. A great decrease in building is a sort of war mortgage—a borrowing from the past to be repaid in the future."

We might interpret that to mean that what building operations are not undertaken during the war period is simply putting off, and that there will be a piling up of these operations when the war is over and an increased activity that will make up for the slow period. If we accept this idea there is room to argue for more building now to the end that there will not need to be such a scramble in building operations during the period following the war.

There will naturally be a great era of reconstruction and building all throughout Europe following the end of the war, a reconstruction that will draw heavily upon the resources of the world for material and men, machinery and tools. Therefore, conditions will continue abnormal and the strain on resources and the demand for supplies will be practically as great compared to the quantity obtainable as exists in the conditions today.

Therefore, while we may not expect to keep going with some of the building in this country that would be done if there was no war, there are other lines that can be promoted and it is plainly the duty of those interested in the manufacture and sale of building material to keep pushing the good work along to the end that more stability will obtain in the building industry, that we may not have a great depression now followed by a great livliness after the war ends.

There is material and men obtainable for the building of factories, warehouses and homes, for great freight terminals and other buildings that are necessary in the conduct of war business, and these should be pushed forward. We may expect some cessation in the building of skyscraper office buildings but there should be enough doing in the way of other buildings that are necessary to supply the needs of the time to make up for this.

Moreover, in the country district there is no excuse for high prices to delay building. The farmer's bushel of wheat will buy more brick and other clay products today than it would have bought before the war or than it will buy again when peace comes to the world. The farmer is receiving a greater advance for all his products than he is called upon to pay for the material necessary to build a home and improve the farm. So there really is no plea to put off building in the country districts on account of higher prices and increased cost, because the prices and the cost are really low compared to the income which the conditions are bringing to the farmer.

There is plenty of logic to be found in support of the plea for efforts to boost building operations along. The main question here now is, what are you going to do about it? Are you going to sit by and let things take their own way without effort or will you join in with others and strive to do your bit in the promotion of more active building while the war is in progress to the end that we may be in better shape all around when it ends? PHIL. OSOPHER.

A Voice From Across the Sea.

My Dear Friend Randall:

I duly received yours some time ago for my dues to the National Brick Manufacturers' Association, and am pleased you did not let me forget it. A few days later I wrote out a check for $5.00. This was on July 4, and have carried this in my pocket till today, expecting to have time to write you, thinking all the time I would do it sure today, and here I am, months behind. Nevertheless, it is none the less sincere, old boy, and wish I could shake you by the hand again, and hope it won't be long when we shall have peace again, but, mind you, a peace that will be a peace.

You know the people of this country are not fighters; they don't want war, and they will do everything in their power not to fight, but if they have to, mind you, they can, and they will, now they have got started, till they have got what they started out for. It takes a very long time to raise the bulldog's temper. They have risen it. He has got hold. No one knows it better than Germany that they have got hold, and they will stick till they get what they started out for. You watch; if it takes every man we have got in this country. How any man can reconcile himself to the belief that there is no other way to settle a difficulty only by shooting one another, is more than I can comprehend, but it seems we are still back to about the year one even yet.

The year the war started I was elected on the Urban District Council for the West Ward for three years, and I am now on no less than eleven committees, of one kind and another, one of which is the Local Tribunal, which is to say whether a man of military age shall stay in civil employment or join the forces. This is a job, I think the hardest I ever had; in fact, I know it is, and if it was in my power to do it, the war would be over before night.

You don't know how glad I am that the United States has come into the conflict. There is no doubt but what it will help considerably to hasten the end, and the sooner it comes, the better—but, say, what a cost! And for what? I wonder if the Germans ever think what they are fighting for—to take from some one else what is not theirs, bringing us back, as I said before, to the beginning, when we thought, especially in this country, that we were through with fighting for territory; and as far as this country is concerned, I think they are—in fact, I know they are—but we had an obligation, mind you; we signed it, and so did Germany, and it is that "scrap of paper," the Lusitania matter, and the Zepps—they could not have done anything better in Germany than to send over their Zeppelins and kill a few women and children, if they wanted to raise the fighting spirit of the people in this country. These are the things that will keep us fighting, to get rid of a few men in Germany that have an idea that all the rest of the world must agree to what they say, no matter what it is. These few fellows never made a bigger mistake than they have done this time; they expected to have finished this war in about three months, but they didn't, and it's not finished yet. If they think they are going to ignore their obligations the way they have done, it will be a long time before they have finished; in fact, they will find they cannot ignore their obligations at this day, and I trust a league of nations will be formed after this to police the world and keep any other nation from such stupid ideas, and forever do away with war and this method of settling difficulties.

We are getting along very well, I can assure you, so far, considering about all we do is for the war in one way and another. Hoping this will find you all well, just as soon as I can after I see the article on the kiln I will write you again. With my best wishes, I remain, Very truly yours,

HERVEY HAIGH.

Slaithwaite, England, August 8, 1917.

Importance of Fuel Economy.

The Editor of The Clay-Worker:

I was reading the other day in Current Comments of the Clay-Worker, under the heading "A Ton of Coal and 1,000 Brick," and beg to say in reply thereto that I have applied for patent through Messrs. Talbert & Parker, patent attorneys of Washington, D. C., for an improved continuous kiln which burns all kinds of clay products with coal dust.

I built a continuous kiln in England in 1895 which is burning today common and face brick (English size 9x3x4½) at 30 cents per thousand. Previous to building this kiln we burnt all our goods in up and down-draft kilns, but on account of the continual use in coal we could make no money, conditions in the coal trade at that time were very similar to what they are in America today. However, after burning the kiln about six months, so great was the saving and advantage we decided to build another one. In 1896 we blew all the old kilns down with dynamite and commenced on a third kiln, using the old bricks, etc., in the new kiln. We were very busy at the time, having many millions of bricks on order, but so great was the saving with the continuous kilns, we bid good-bye to the old system of burning forever.

Mine-run coal was costing at the time $3.00 and more per ton at the mines, coal dust about 30 cents per ton, there being practically no market for coal dust at that time. It took a ton of coal and upwards to burn 1,000 brick in the up and down-draft kilns, whereas we were burning bricks much better in the continuous kilns with less than 400 pounds of coal dust per 1,000. Coal dust is selling at the mines in England today at $2.00 per ton, yet the bricks are being burnt at 30 cents per thousand. I have the facts in my possession, which any one interested in the trade can see. I have also sample bricks from England (just arrived) which were burnt in these kilns.

The last two kilns I built in England were 26 chambers each, and we ran two fires in them and they are burning at the present time a quarter of a million bricks per week each. Previous to the war $3.00 per 1,000 was considered a good price for common bricks at many large works where these kilns were in operation, the bricks being put direct from the machines into the kilns and dried and water-smoked as they went along. So you see, Mr. Editor, what I am writing about is no wild, untried scheme, but common conditions in England. I am open to any interview and will answer any questions put to me.

After practically a life's experience in the trade under all conditions I know of no system of burning equal to continuous kiln fired with coal dust to make money and beat competition.

H. WEBSTER.

REQUIREMENTS OF SILICA BRICK.

Strength and Spalling Losses Related to Size of Ganister—Causes of Failure.

THE INFLUENCE on the physical properties of silicon brick of pressure and degree of fineness of material used in their manufacture were described in a paper presented before the American Society for Testing Materials at Atlantic City, June 26, by C. E. Nesbitt and M. L. Bell, of which the following is a summary:

Two very important properties of first-class silica brick are mechanical strength and resistance to spalling. The strength as indicated by impact tests is greatest when finely ground ganister is used, while the loss by spalling increases with fineness of mesh. Hence a mesh must be selected at the expense of one of these properties. As more is gaind by a coarse mesh a coarsely ground material is advocated.

The average spalling loss for hand-made silica brick is about 30 per cent. Power-pressed silica brick were made with the same spalling loss from 4-mesh material pressed at 1,500 pounds per square inch. These brick were true to shape, sharp-cornered, dense and had smooth, marble-like surfaces. Molding defects, such as soft corners, sponginess, improper slicking and lack of cohesion were all eliminated. The prospect of the adoption of power pressing as a step towards better and more uniform silica brick was clearly brought out. The idea of power pressing is not entirely new, yet little has been done in a commercial way. One of the large concerns is now manufacturing brick this way on a commercial basis. The average spalling loss of these brick is 25 per cent.

In actual service, although well guarded as far as practice and construction will permit, silica brick fail from three primary causes; spalling, crushing, and slagging. These cannot be entirely eliminated, but by a deeper study of the manufacturing of brick they can be reduced to a minimum. An ideal brick must be well molded, true to shape, thoroughly bonded, and of good mechanical strength.

A visual inspection of almost any shipment will show at least 20 per cent. of defective brick. Six shipments of brick of different brands brought out the fact that 60 per cent. of the defects were due to molding, 30 per cent. to fire cracks, and 10 per cent. to improper setting and irregular shapes. These defects can be largely overcome in the present method of manufacture by careful inspection and rejection of the improperly made brick at certain points in the manufacture.

The ganister must be carefully selected, and sorted, all rock that is soft or which carries considerable iron, clay, sandstone or other foreign matter should be rejected. The ganister selected should be ground to just pass a 4-mesh screen, care being taken to avoid an excessive amount of finely ground material. To insure uniformity, frequent sieve tests of the mud should be made. To secure a sufficient bond, 1.75 to 2 per cent. of lime should be used. To avoid irregular shapes and molding defects, 9 to 11 per cent. of water should be used for hand-made brick and the material should be pounded into the mold. The brick should be thoroughly dried so as to avoid fire cracks when placed in the kiln. Great care should be used when heating, especially during the first part of the burn, to prevent fire cracking. This applies also to the cooling. The brick as they are removed from the kiln should be carefully inspected, and all brick showing molding defects, fire cracks and irregular shapes should be rejected.

The consumer should be allowed to inspect the brick before they are loaded on the car and a place should be provided for storage of such brick as he may desire to test.

THE SPLIT BRICK.

Around the fire brick plant one encounters an item in brick that is seldom met with at the building brick plant, but might be introduced. This item is the split brick or half thickness in brick. Enough of these are needed in laying up fire brick that they have come to be a regular item in stock, and in some places instead of splitting a standard brick before burning the splits of half thicknesses are made with the press just the same as the full thickness. Split brick are not so generally used in the building industries as in laying up fire brick but they are used some and it will likely prove an interesting departure that would be appreciated by builders if the brick manufacturers would introduce enough half thickness brick to make up the needs for the bricklayer and save splitting with the trowel. We not only have the split brick in the fire clay product but we have half sizes in hollow tile and somehow there seems room to introduce into the building brick business the item of split brick.

CHANGES IN THE BUILDING TREND.

Quite a lot of things have been happening to the building situation since we entered the war. Commenting upon this happening in relation to building operations, the American Contractor says that today we speak of curtailed building operations, which is the popular interpretation of the war's effect on building. This though, does not tell the whole story, rather we should say change in the building trend.

All business conditions have changed practically as much during the past few months as during the last two years, because the fundamental factors influencing business have taken on a radically altered aspect due to our entering the war.

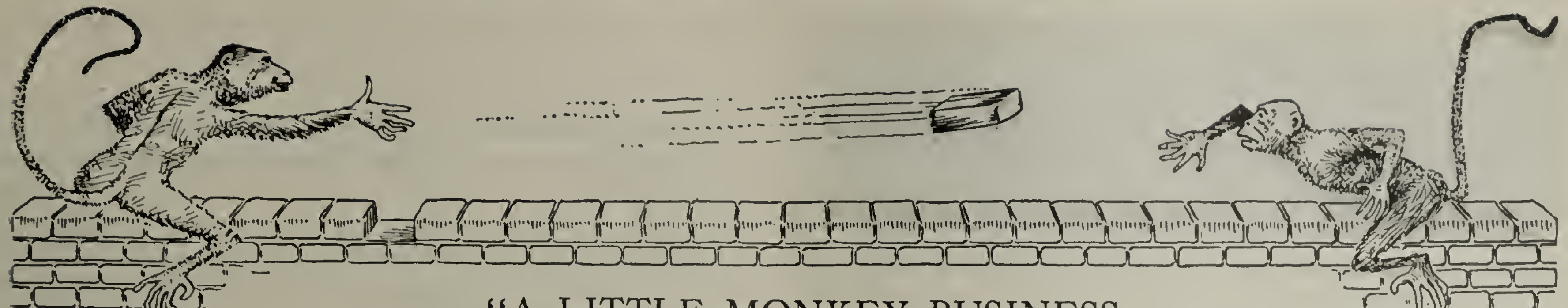
After all, however, it is evident that the entire volume of building operations during the war will be great, perhaps as great as if we had not entered the war, but there has been a great shifting about and there is no such thing as normal conditions any more in the old sense of the word. It is new conditions all around us and they call for active study to the end that we may make the best out of the situation.

Much home building has been discontinued, that is, the building of less expensive homes. On the other hand, in actual value of construction work this has been offset by a building of temporary homes for soldiers in the many army camps throughout the country. This camp building has been a cheap, quick construction, involving the use of more lumber than anything else. It has called for some brick, but more sewer pipe and drain tile than of brick proper. Now that the army camps are completed in the main there is some chance to encourage home building and the use of brick, because brick has not increased in price like other materials and now that the government building rush is over there will be more workmen and building contractors in a position to co-operate in promoting home building.

We need not expect much of the typical skyscraper building until conditions are easier in the structural steel market. To make up for this, however, there is a great increase in manufacturing operations which should carry with it more in the way of factory buildings and warehouses.

Manufacturing operations have practically doubled as compared to the same time last year, and this means more factory space and more warehouses. Moreover, it means the use of brick walls and of mill construction instead of the old steel skeleton frame idea, which will contribute more to the clayworking industry than if conditions were normal in the steel industry.

We may expect out of this change a better situation for general building and for brick and other clay products now with the completion of the government work which makes more help available. When people turn their attention to building, whether it be hog houses on the farm or new homes, a little inquiry will impress the fact that burned clay is not only the best building material, but it is the most readily available and has increased less in price. All of this will prove a great boost for brick and in the end we should find that while building operations have undergone changes, there is still plenty doing and plenty of room to promote interest in building with brick.



"A LITTLE MONKEY BUSINESS NOW AND THEN IS RELISHED BY THE BEST OF MEN."

Getting Its Age.

"Casey," said Pat, "how do you tell th' age of a tu-u-rkey?"

"Oi can always tell by the teeth," said Casey.

"By the teeth!" exclaimed Pat. "But a tu-u-rkey has no teeth."

"No," admitted Casey, "but Oi have."—London Optimist.

* * *

Why Not?

Jimmie giggled when the teacher read the story of the man who swam across the Tiber three times before breakfast.

"You do not doubt that a trained swimmer could do that, do you?"

"No, sir," answered Jimmie, "but I wonder why he did not make it four and get back to the side where his clothes were."—Awgwan.

* * *

Not the Right Puppies.

Doris' father raised chickens, and Doris understood all about setting hens. One day she was taken to see the new litter of puppies. They were curly black balls cuddled down beside a smooth tan mother.

"Are those really Emmy Lou's puppies?" Doris asked.

"Yes, dear," she was told.

"Well, then," she remarked in a disgusted tone, "she couldn't have sat on her own eggs."

* * *

She Went by the Sign.

Little Ellen was told by her mother on their arrival in town to hitch the horse and then come to the store where they were going to shop. A few minutes later the mother was surprised to see Ellen driving up in front of the store again and hurried out to see what was the trouble.

"I picked out a nice shady place on that side street there," Ellen explained, almost in tears, "and was just going to tie up when a woman called from a window that horses mustn't be hitched there. I don't see why she said that, because there was a sign right there on the tree that said 'Fine for hitching'!"

* * *

Hard Wheat.

"I just stopped to tell you about that flour you sent me the other day," said Mrs. Newlywed.

"Why, madam," answered the grocer, "that was the best flour I carry in stock. What was the matter with it?"

"Matter, indeed! Why, it was so tough my husband couldn't eat the biscuits I made with it."

* * *

He Understood.

The pale-faced passenger looked out of the car window with exceeding interest. Finally he turned to his seat-mate.

"You likely think I never rode in the cars before," he said, "but the fact is, pardner, I just got out of prison this mornin' and it does me good to look around. It is goin' to be mighty tough, though, facin' my old-time friends. I s'pose, though, you ain't got much idea how a man feels in a case like that."

"Perhaps I have a better idea of your feelings than you think," said the other gentleman, with a sad smile. "I am just getting home from congress."—Argonaut.

* * *

A New Version.

In a big elementary school a teacher had given a lesson in an infants' class on the Ten Commandments. In order to test their memories she asked: "Can any little child give me a Commandment with only four words in it?"

A hand was raised immediately.

"You may answer, John," said the teacher.

"Keep off the grass," was the reply.

* * *

Forgetful.

Two lawyers before a country justice recently got into a wrangle. At last one of the disputants, losing control of his temper, exclaimed to his opponent: "Jim Rogers, you are the biggest jackass I ever set eyes upon!"

The justice pounded the desk and called loudly: "Order! Order! You seem to forget that I am in the room."—The Argonaut.

* * *

How Could She?

A class of little girls, studying drawing, was told by the teacher to draw the one thing they most wanted. All got busy except little Myrtle, who remained deep in thought.

"What's the matter, Myrtle?" asked the teacher. "Don't you know what you want most?"

"Oh, yes, ma'am," replied the child, "but I don't know how to draw it."

"Well, what is it you want?" asked the teacher.

"I want to be married," said the child.

* * *

Cutting Prices.

(Apologies to Hamlet.)

To cut or not to cut, that is the question,
Whether it is not better in the end
To let the chap who knows not the worth
Have the business at cut-throat prices, or
To take up arms against his competition,
And by opposing cut for cut, end it.
To cut—and by cutting put the other cutter
Out of business—'tis a consummation
Devoutly to be wished. To cut—to slash,
Perchance myself to get it in the neck—
Aye—there's the rub; for when one starts to meet
The other fellow's price, 'tis like as not
He's up against it good and hard.
To cut and to slash is not to end the confusion
And the many evils the trade is pestered with;
Nay, nay, Pauline; 'tis but the forerunner
Of debt and mortgage such a course protends.
'Tis well to get the price the goods are worth
And not be bluffed into selling them for what
So-and-So will sell his goods for.
Price cutting doth appear unseemly
And fit only for the man who knows not
What his goods are worth, and who, ere long,
By stress of making vain comparison
'Twixt bank account and liabilities,

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

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My Country, Right or Wrong—My Country!

CURRENT COMMENT.

School days. Happy, happy school days.

* * *

We older folks have some things to learn this year, too. So let's set about it.

* * *

It keeps looking like our peace terms will have to be handed to the Hun on a bayonet.

* * *

Sewer pipe and sanitation go hand in hand, and sewer pipe is doing its bit to make army training camps healthy.

* * *

One of the good news items of the month is that which tells of the raiding of working headquarters of the I. W. W.

* * *

We notice an onward trend of the motor truck as well as an invincible march of our boys toward training camps and victory.

* * *

Eventually as a result of the war we are going to get better team work between government and industry as well as in the industries themselves, but there is naturally involved quite a warring with words in the process which we should seek to shorten, to reduce and to harmonize.

* * *

Building operations are down to just about half rations, taking the country over, which makes a condition that needs to be remedied.

* * *

Yes, the income tax will be heavier, but the heaviest burden on a man's income these days is found in the increased cost of the necessities of life.

* * *

This talk of eggs going to a dollar a dozen is enough to make the average brick man look around for some industrious hens to install as a part of his working force.

* * *

With the coming of cold weather the brick fire place comes in for more thoughtful appreciation than during the summer months and it is a good time to get out fire place literature.

* * *

Whatever fame or public favor is obtained by Mr. Hoover in wrestling with the food question will be fully earned because he has a big problem before him calculated to generate much unpopularity.

* * *

One of the things which helps in this country to speed up manufacturing output is the fact that manufacturing is standardized in the United States to a greater degree than in any other one country.

* * *

The government may regulate the price of coal, but the question of supply is something else, and those needing it may well take steps to safeguard their supply commensurate with their needs this winter.

* * *

Reports of new large corporations formed in one month of the year with capital totaling about half a billion dollars, and most of the concerns with capital running above the million mark, sounds like big business.

* * *

We thought about the last word in the matter of cost and cost keeping had been said but now war conditions have upset all past calculations and the business world is in for an entire revision of its cost sheets.

* * *

A red-lettered line at the top of a letterhead coming to this office states that a fourth of all America builds each year is destroyed by fire. This is not only one answer to why people should build with brick, but it is a reminder that we should put up more of those Build With Brick signs.

THE AMERICAN CERAMIC SOCIETY AND ITS INFLUENCE.

Attention is directed to the short article on Ceramic Engineering appearing in this number. All engineering professions have a representative society and in this country the American Ceramic Society represents the ceramic engineering profession.

Progress in the ceramic industries has been conspicuously accelerated during the past ten or fifteen years and this is no doubt due, in a large measure, to the interchange of ideas, the presentation, discussion and publication of papers, the creation and cultivation of the spirit of co-operation amongst ceramic engineers and other advantages made possible by the American Ceramic Society.

Any one whose chief interest lies in the ceramic field or who is engaged in ceramic engineering, or manufacturing, can ill-afford to continue without membership in this society. A profession or establishment which cannot afford the small annual dues for membership in order to keep in touch with the foremost men and most advanced thought in the field of ceramics, is surely not upon a very secure or progressive basis.

Through its Membership Committee, the American Ceramic Society is attempting to double its membership during the present year and it is earnestly hoped that every clayworker will accept this opportunity of taking his place in the ranks of the society.

THE WASTE OF COAL THROUGH INEFFICIENCY.

The director of the Bureau of Mines is credited with the statement that 25 per cent. of the coal production of the United States is wasted through inefficient use. The point here is that a large proportion of the steam engine and boiler plants of the country are old style and more efficiency could be obtained with later types of boilers and engines. The logic of this is good enough, but the trouble is in the difficulty of obtaining new boilers and engines in this day of strenuous war demand for metal products.

"THE SUCCULENT FREIGHT CLAIM."

Under the above title there appeared in a recent issue of the Saturday Evening Post a story about freight claims which was not only interesting as showing the ingenuity of unscrupulous people in their plans to beat the railroads, but it also demonstrates that there is another side to this question and the railroads have their troubles as well as the shippers.

It is refreshing to turn for a moment from hearing continuously one side of this matter, hearing railroads abused and fussed at by the shippers because of delays and damage in transit, overcharges and all sorts of things making ground for claims, and to read the other side of the question, to hear the story of the claim agents and find that the railroads have a case to present as well as the shippers.

There is not much thieving by outside parties of brick and clay products as was found in goods of many other kinds, and it is perhaps very seldom indeed in the clayworking industry that any one sets about to deliberately beat the railroads out of something via the claim route. They catch it in other lines, however, and that is why they are so slow and so critical in their investigation before allowing claims, even though the claim is plain, and also plainly just.

A reading of this story of the other side of the question will serve to temper the animosity the average shipper feels over the shortcomings of the railroads which make necessary claims for damage in transit, for overcharges, etc.

PAINT UP AND PATCH UP.

The higher prices for equipment and supplies all around should lend zest to plans for repairing and patching up and preserving the old equipment. Before the winter season comes on there should be among the clayworking industries a regular clean up, paint up and patch up campaign to put a check on depreciation and to lessen the amount of new equipment and supplies that it will be necessary to buy.

This order of paint up and patch up should be made to apply all through the plant from wheel barrows to the roof and the building itself. All the equipment should be gone over from wheel barrows to the newest machine and thoroughly cleaned and where it is likely to damage from rust paint it and put it in order. Moreover, any and all parts of the equipment and appliances which are in need of repairs should be patched up. It is a good time to go on the theory that a stitch in time saves nine, and to get busy in taking that stitch. The blacksmith shop and the local machine shop, and the all-around mechanic with a kit of tools, can do a lot in a few weeks time in the way of putting a check to depreciation and in putting machines and equipment in order so as to lessen the bill for repairs and for new equipment. We have in the past been inclined toward considerable recklessness in connection with machinery and equipment. We have figured that it is often better to buy new and more up-to-date machines and appliances than to patch up old ones and keep them in service. This is an order that had some reason for it in days gone by, but we are in the midst of new conditions right now and many of the old orders of things are in need of changes.

The first and best place to start the changes and to put practical conservation into practice is to be found right at home. Start in with a campaign to clean up, patch up and put the plant in order from end to end, for a little good work done along this line in time will save a lot in depreciation and will make unnecessary the buying of so much in the way of repair parts, supplies and new machines.

THE COAL SITUATION.

A little light is being thrown on the puzzlement of the coal situation which held all last winter, and still continues to quite an extent, by a press bulletin of the Geological Survey reviewing the consumption of the railroads.

Figures compiled by C. E. Lesher, of the Geological Survey show that the railroads of the country used 136 million tons of bituminous coal in addition to nearly 7 million tons of anthracite and some coke during the year 1916. This was 14 million tons more than was used in 1915. The railroads themselves by virtue of being unusually busy consumed 11½ per cent. more coal than usual.

This consumption by the railroads represented about 27 per cent. of the total coal production. Meantime, however, consumption for other needs increased in even greater ratio than the consumption by the railroads. Various industries throughout the country, especially metal-working industries and machine shops and power plants of all kinds called for even greater increases in the coal requirements than the railroads. In other words, the increase in the railway consumption of coal was fairly typical of the increased consumption all around and this explains why lots of people ran short of coal, and the price went skyward when the supply coming forward was not sufficient to meet the needs. At this writing there is some improvement in the situation, a better volume of coal moving and there are many new mines being opened so that if help is available and the railroads can furnish the cars there will be plenty of coal to supply all the needs. The whole situation hinges right now upon help at the mines and the car supply. The market is somewhat easier all around just now and some are hopeful that it will continue easing down, while others contend that there will be a scramble again during the winter. The winter season increases materially the coal requirements, so materially in fact that it is doubtful if there is much easing in coal prices after cold weather sets in until along next spring. Broadly speaking, soft coal costs today practically twice the price of eighteen months ago and those brick manufacturers who depend upon coal had better figure upon this basis for the coal cost in brickmaking.

ANSWERING INQUIRIES.

We have heard for years complaints from secretaries of organizations and from individuals who have taken up subjects of general interest, complaints that people are slow to answer inquiries. There is no doubt whatever about this slowness, and the disappointment to the average man who undertakes to gather data from any branch of the industry. We are finding now, however, that there is another side of it. A part of the explanation of the reluctance to answer questions is found in the fact that too many people ask too many questions.

During the present year, for example, people in every branch of the industry have received questionaires from dozens of different sources, and not only so many of them as to be annoying, but too often the people asking questions put in too many questions and ask for too many details.

There is before the writer at the present a letter from an association secretary wanting information about local or group organization, in which the secretary in addition to the letter propounds 28 specific questions to which he asks answers. Many of these questions are so distant from the subject matter as to be irrevalent and it would hardly be practical to make an intelligent reply by answering the questions propounded. This is just a sample of many such things. The government sends out a line of inquiries and the sharp pencilled experts in the department getting up these question blanks put so many questions into them that the people receiving them become discouraged and simply throw the whole business aside.

Then along come various committes at Washington, some duplicating questions of others, and all of them asking so many questions that if the average business man should undertake to answer all these questionaires in all their details it would take up about as much of his time as is required in the conduct of his business.

There are a lot of questions that should be asked and answered in the industry for the sake of gaining information and making progress, but the work of getting and tabulating such information is being made even more difficult than it naturally would be by the shower of questionaires being sent out broadcast from so many different sources, and the multitude of questions involved therein, some of them verging on the impertinent, many of them not of sufficient importance to justify them being included. It is time to eliminate a lot of detail out of this business and get down to common sense and essential factors.

OBITUARY.

Death of Charles G. Stevenson, Wellsville, Ohio.

The brief announcement of the death of Charles G. Stevenson president of the Stevenson Company, Wellsville, Ohio, will be a shock to his many friends in the clay industry. He was a man of such robust physique that it is hard to comprehend his untimely demise, which occurred Wednesday, September 5. He has been a member of the National Brick Manufacturers' Association for many years, and seldom missed any of the annual meetings, at which he was a conspicuous figure because of his genial personality and extraordinary energy.

Passing of Howard Valentine.

Howard W. Valentine, one of the best known clayworkers of New Jersey, died at his home in Woodbridge, N. J., September 5, following an illness of several months' duration. Mr. Valentine was a member of the firm of R. N. and H. Valentine, which had been in existence almost half a century, and up to the time of his illness he had taken an active part in the affairs of the company.

Death of Well-Known Tile Manufacturer.

D. E. Child, one of the best-known brick and tile manufacturers of western Ohio, died at his home in Findlay, Ohio, September 6. Mr. Child was a native of Ohio, having been born at Oberlin in 1843, and settled in Findlay in 1887, and formed a partnership with Dorney, Child and Murray, engaging in the manufacture of brick and tile. Later he bought the interest of Mr. Dorney. In 1892 the factory was burned to the ground, at which time Mr. Murray lost his life. Mr. Child bought the interest of the Murray heirs and operated the plant until 1903, at which time he purchased the competitive plant known as the firm of Dorney & Harris. This business has been conducted under the name of the Hancock Brick and Tile Company, of which he had been president. With him in the business has been associated his three sons, D. Earl, Roy B. and J. Leo Child.

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WANTED, FOR SALE, ETC.

STEAM SHOVEL WANTED.

Rebuilt traction steam shovel, ⅝ dipper. Must be in first-class shape for service. Write full and correct condition. Address HUNTSVILLE,
9 1 d Care Clay-Worker

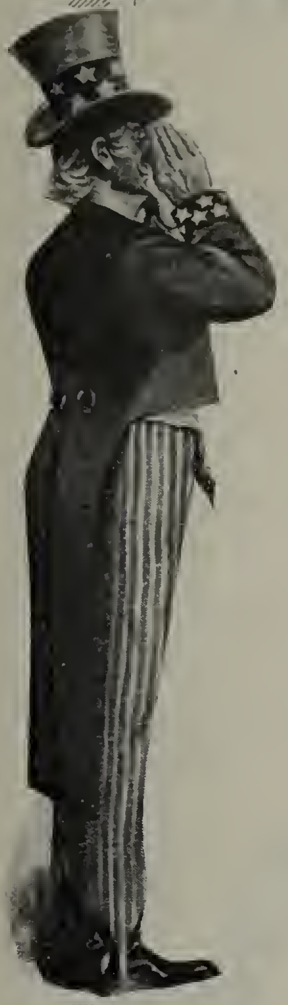
WANTED

Partner to join me in putting on the market an improved continuous kiln. Patent applied for. Burns bricks with less than 400 pounds of coal dust per 1,000. I have been burning continuous kilns for 25 years, so this is no untried scheme, but absolutely genuine, and will guarantee what I say. I shall be pleased to give full particulars to anyone interested, or can be seen by appointment. Address, HAMDEN,
9 1 c Care Clay-Worker.

For Sale, Wanted, Etc., Ads Continued on pages 279 and 280.

Uncle Sam Salutes The American Line

Built Right Run Right



The press of war is making economy necessary in every line of business.

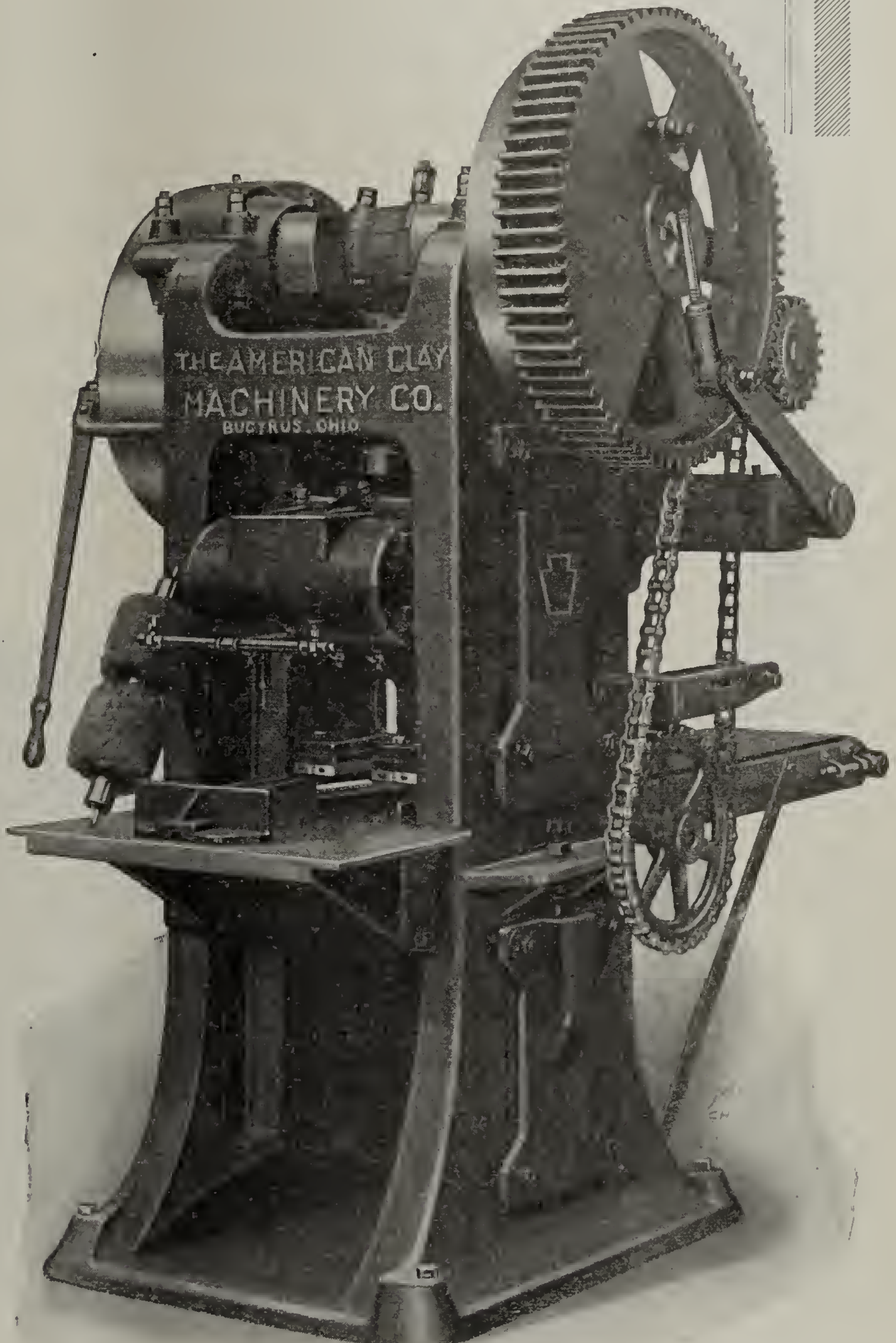
Here is the "Press of War," because it will assist toward economy in making clay products.

The American No. 292 Repress is a worthy member of the American Line.

Its predecessor, "The Eagle Repress," was without doubt the most popular and efficient press up to its time.

The No. 292 Press has all the big features of the Eagle and has many new ones of its own. It is serving well in its field and its record will be sent you on application.

We build every machine and appliance required for the economical manufacture of Clay Products. Small as well as large wants receive the most careful attention.



The American Clay Machinery Co.

Bucyrus, Ohio

Uncle Sam Salutes The American Line

Built Right Run Right

The American No. 232 Auger Machine is a credit to the "American Line" of Built Right Run Right machinery.

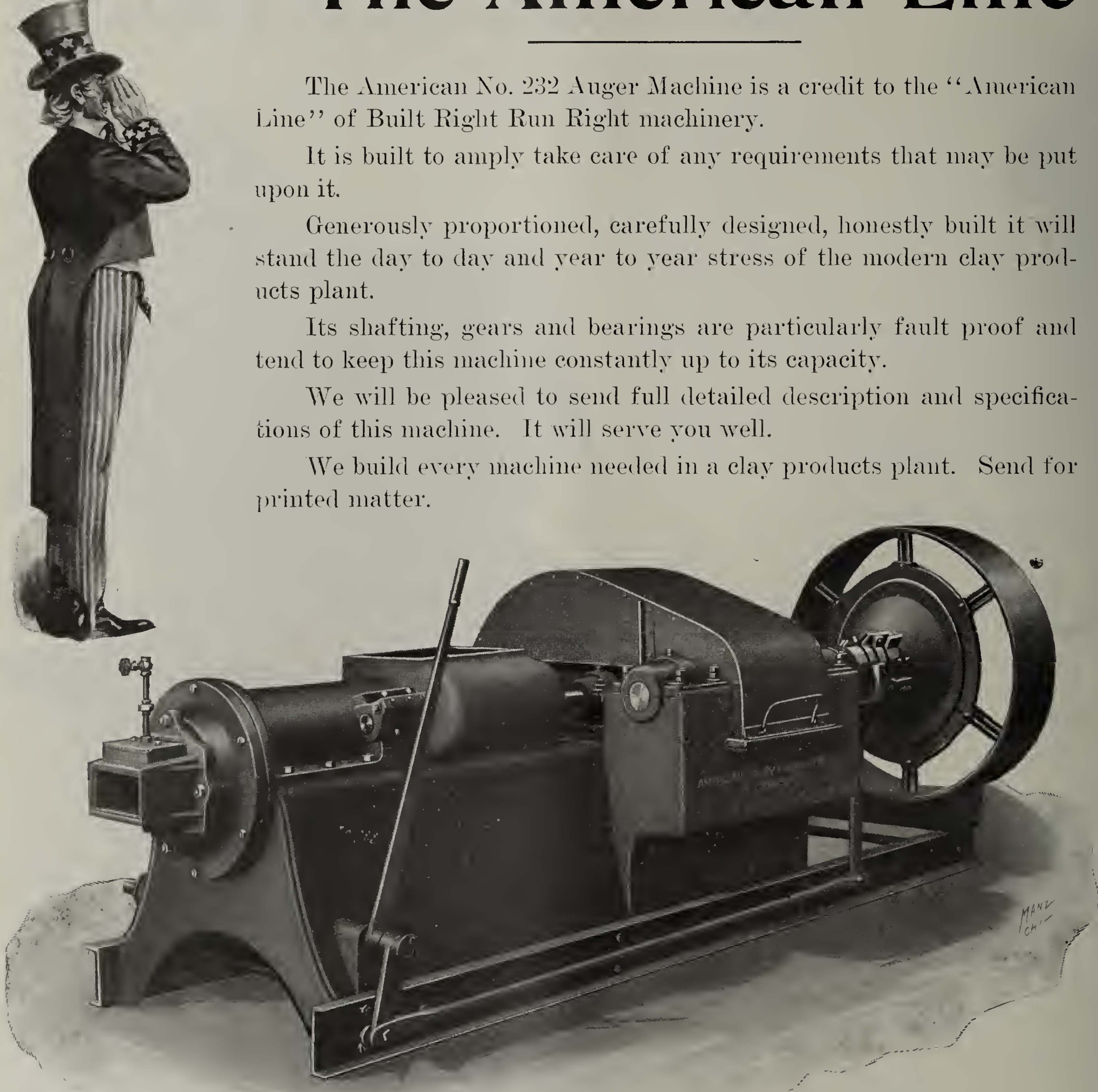
It is built to amply take care of any requirements that may be put upon it.

Generously proportioned, carefully designed, honestly built it will stand the day to day and year to year stress of the modern clay products plant.

Its shafting, gears and bearings are particularly fault proof and tend to keep this machine constantly up to its capacity.

We will be pleased to send full detailed description and specifications of this machine. It will serve you well.

We build every machine needed in a clay products plant. Send for printed matter.



The American Clay Machinery Co.

Bucyrus, Ohio

Uncle Sam Salutes The American Line

Built Right Run Right

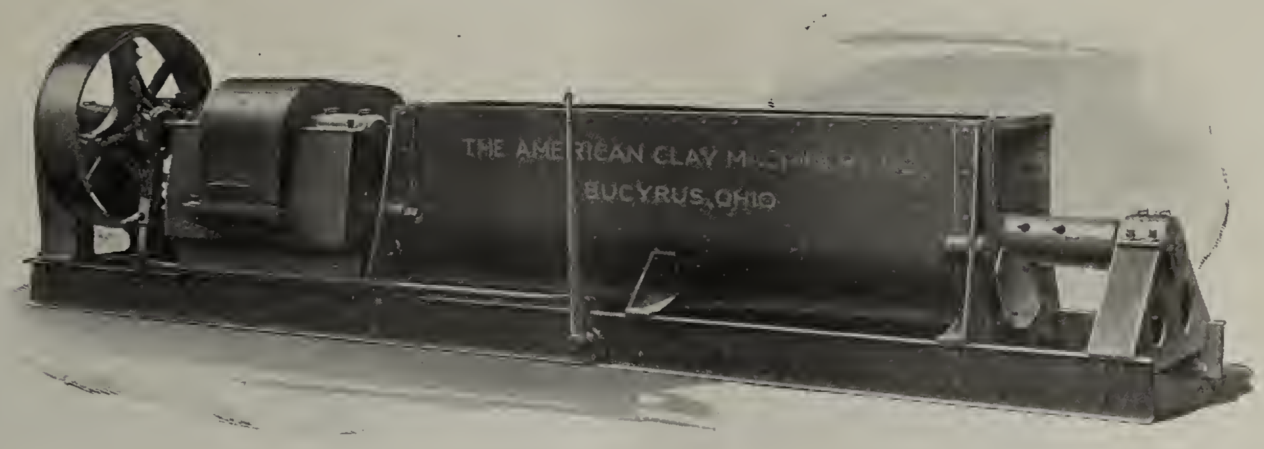
Other worthy members of the "American Line" of Built Right Run Right clayworking machinery are our Pug Mills and Granulators.

These machines are designed to do more and better work and save power,

They are built in both the pushing and pulling type which makes it possible to deliver the prepared material at either end of the machine.

They are strong, rigid, easy running machines with excellent bearings, shafts and gearing, all proportioned and selected to save expense on repairs.

These machines are amply proportioned and are sure to give satisfactory operation. We build any machine or appliance you may require, and will be pleased to answer any questions or send facts, figures and photographs.



The American Clay Machinery Co.

Bucyrus, Ohio

Uncle Sam Salutes The American Line

Here is another member of the "American Line," which will help you toward lower cost and higher profit.

This is Uncle Sam's **"First Lieutenant"** in his "army of conservation," because it saves fully a half of the fuel ordinarily used in burning clay products.

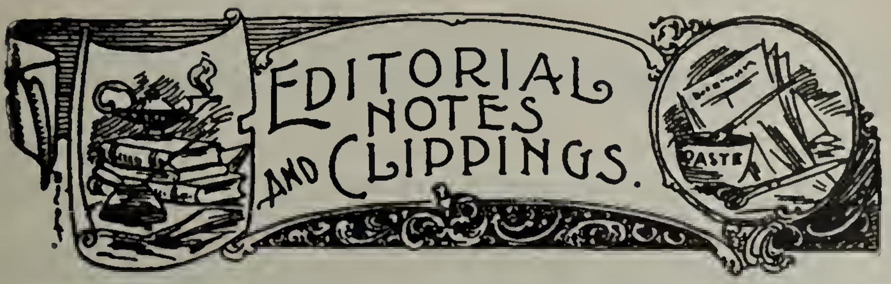
Why waste when the whole world is making every effort to save? This saving may be your salvation as a manufacturing concern.

Let us send you an estimate of what it will cost you to install a Haigh Continuous Kiln that will save half your fuel and half your kiln labor.

This information costs you nothing.

The American Clay Machinery Co.

BUCYRUS, OHIO



EDITORIAL NOTES AND CLIPPINGS.

The Binghamton Brick Company, N. Y., has increased its capital stock from $30,000 to $50,000.

Virgil M. Krick, an experienced clayworker of Decatur, Ind., will move to Auburn, Iowa, where he will have charge of the Auburn Brick & Tile Co.

Fire, which caught from an overheated kiln, destroyed the coal shed and a goodly supply of coal at the plant of the Groton Brick Works, at Groton, S. Dak.

The Groesbeck Brick Company, of Groesbeck, Texas, has increased its capital stock from $17,000 to $32,000, and will make a number of improvements in its plant.

The Jenkins Brick Company, of Montgomery, Ala., has just completed arrangements for manufacturing the Dennison interlocking tile, in addition to their other products.

The Star Brick Company, of Epping, N. H., is in the market for a ¾-yard steam shovel. They would like to get a second-hand shovel, but it must be in first-class condition.

The plant of the North Iowa Brick & Tile Co., Mason City, Iowa, was damaged to the extent of $1,000 by fire, recently, which originated in the dryer. The loss is fully covered by insurance.

John T. Moore has sold his interest in the A. T. Small Brick Company at Macon, Ga., to A. T. Small, who is now sole owner. Mr. Moore will devote his time to a number of other enterprises in which he is interested.

Ralph T. Haws, who for many years has been connected with the Climax Fire Brick Co., Clarion county, Pa., has been named general manager, secretary and treasurer of the company, succeeding Charles H. Luke, who resigned a short time ago.

Raymond Robinson, of the New Jersey Brick Company, of Matawan, N. J., was attacked by four highwaymen while carrying $10,000 for paying off the employes, and wounded, though not seriously. He finally drove them off with an automatic revolver. All of the robbers have since been arrested.

Employment of women in its plant in order to fill up the gaps among the men operatives due to the prevailing shortage is being inaugurated by the General Fireproofing Co., Youngstown, Ohio. A number of women are engaged in running punch presses, sanding machines and in doing bench work.

The regular monthly meeting of the Eastern Face Brick Association, which is composed chiefly of manufacturers of red brick in Pennsylvania and New York, was held at Lock Haven, Pa., Tuesday, September 11. A. C. Tevling, manager of the Mill Hall Brick Company, had charge of the arrangements for the entertainment of the visitors.

The Bradford Pressed Brick Company, Bradford, Pa., has received an order to furnish red hollow building tile to be used in the construction of the first four buildings for the United States armor plate plant at Charleston, W. Va. The order calls for 100 carloads of hollow tile, the shipments of which are to start in two weeks. The receiving of this order by the Bradford Pressed Brick Company is indeed gratifying, as it is the first order issued for the United States armor plant by the government. The Bradford Pressed Brick Company is also furnishing hollow tile for the aircraft plant being built at the U. S. government navy yard, League Island, Philadelphia. Quantities of the same materials are also being shipped for the U. S. naval reservation, West Hingham, Mass.

The Ancho Brick Company, of Sante Fe, Texas, is planning to manufacture fire brick, for which their clay is well adapted.

L. W. Maxwell is at the head of a company that will erect a plant at Bellevue, Iowa, where they will manufacture hollow building tile, drain tile and flower pots.

The Joseph Soisson Fire Brick Company, of Connellsville, Pa., recently booked an order for 300,000 paving brick, at $23 a thousand, for paving the streets of Connellsville, Pa.

Frank Bagley, a well-known and experienced clayworker, of Zanesville, Ohio, has been engaged as superintendent of the Lake Shore Shale Brick Co., at Ashtabula, Ohio.

Fire at the plant of the Glenwood Brick Co., Erie, Pa., caused a loss of approximately $15,000. Joseph Dudenhoeffer, general manager, is pushing the work of rebuilding the burned portion.

A charter has been granted to the New Castle (Pa.) Mining and Clay Product Co. Incorporators are Charles W. Rhodes, Charles H. Andrews, Fred L. Bentz, John A. Butler, E. W. Beadle, M. A. McLure and George T. Weingartner, all of whom are directors for the first year. Capital, $60,000.

According to Charles H. Bray, secretary and general manager of the Western Clay Manufacturing Co., Helena, Mont., building activities throughout Montana generally are very good, and the outlook for his company is the best they have had for years. They now have on their books orders for surrounding towns, as well as for Helena.

Fire destroyed the roof of a kiln in No. 1 brick yard of the Sioux City Brick and Tile Company at North Riverside, Iowa. Spontaneous combustion of coal in a bin was the cause. The flames, which were discovered by an employe, for a while threatened to spread to other buildings and a second call was sent in. The loss is estimated at $4,000.

The Western Brick and Supply Company, of Lincoln, Neb., of which A. H. Farren is president, now handles the products of five different plants. The company uses the products of the Yankee Hill Brick Manufacturing Company, as well as those of its own plants at Holdrege, Hastings and Nebraska City. Thirty-three million brick are manufactured and sold annually. In addition, the company also operates sand pits and stone quarries.

The Ohio State brick plant at Junction City, Ohio, which is operated by convicts and which has been closed since last fall, has been started again and will run to full capacity. W. H. Arehart, of Roseville, Ohio, has been appointed superintendent of the plant. There are now over a million brick on hand, 500,000 of which will be used in the immediate future for the new building to be erected by the Ohio State University at Columbus, and the rest will be used for paving highways.

In a bill for a receiver filed against the Southern Fire Brick and Clay Company, Chattanooga, Tenn., by William C. Hinterman, holder of nine shares of the company's stock, it is charged that a conspiracy exists between the officers and directors of the company. The company is capitalized at $250,000, and the petition alleges that no dividends have been paid since 1905. It is further alleged that the outstanding indebtedness of the company is $250,000, and that it is insolvent. The bill alleges that for several years the entire output of the Southern Fire Brick and Clay Company has been sold under contract to the T. C. Moulding Brick Company at a price below the market. The bill recites further that T. C. Moulding is president of both companies, and that the contract is merely a means of depriving the stockholders of the Southern Fire Brick and Clay Company of any profits.

The Pulverized Fire Clay Company, of Nelsonville, Ohio, has been incorporated by H. A. Hall and others, with $10,000 capital stock.

Fire, which started in the dryer of the Brooks Brick Company, of Bangor, Me., resulted in a loss of $200. The company carried no insurance.

Wm. Bloom, an employe at the plant of the Minnesota Pipe & Tile Company, Mankato, Minn., fell while working about the plant and received injuries which resulted in his death.

The Marion Pressed Brick & Tile Company, of Marion, Ill., has had an unusually busy season, running to full capacity right through the summer, and getting a good price for their output.

E. L. Watts, secretary of the Hebron Fire & Pressed Brick Company, of Hebron, N. Dak., has resigned his position. Mr. Watts has been associated with the company ever since its organization.

The Harbison-Walker Refractories Co., Pittsburg, Pa., declared an extra dividend of 6 per cent. on the common stock in August. The regular quarterly dividend of 1½ per cent. on the common stock was also declared. The directors also declared the regular quarterly dividend of 1½ per cent. on the preferred stock.

The Camden Pottery Company, Camden, N. J., announce that at a recent meeting of the board of directors, T. Munroe Dobbins was unanimously elected president and treasurer of the company, while Arthur J. Podmore was elected secretary and general manager. The new officers state that it will be their endeavor to carry out the previous policies of the company.

Notices were posted August 25, by the Coshocton (Ohio) Brick Company, stating that both skilled and common labor would be given a raise of 25 cents a day beginning next pay. Under the new management the company has been forging ahead and the advance in wages was given voluntarily. The prospects for the remainder of the year look excellent in spite of the uncertain war conditions.

The Howard Refractories Company, of Baltimore, Md., has been recently organized to succeed the Howard Fire Clay Co., with plant at Howard, Md. The new company will remodel the plant, adding five kilns and other improvements, with a view of increasing the output of the plant to 60,000 fire brick per day. The officers of the new concern are: President, J. H. Philbin; secretary, Abraham Wolf; treasurer, Frank R. Small.

The Nansemond Brick Company, of Suffolk, Va., was recently incorporated with $100,000 capital stock, and has taken over the plant of the Nansemond River Brick & Tile Company, which includes a 600 acre farm. The company will make a number of improvements in the plant and increase the capacity to 50,000 per day. A. V. Sturgeon is president and manager; H. H. Bartlett, vice president, and Joseph B. Moss, secretary.

With the completion of the brick work at the new building of the Onondaga Pottery Company, the Onondaga Vitrified Brick Company, Syracuse, N. Y., has completed one of the largest contracts of the summer season in that city. The company is at present fulfilling contracts for brick in neighboring cities, making regular shipments for the building operations at the Potsdam Normal School at Potsdam and the Arrowhead Mills at Fulton. Practically all the contracts have been for shale brick. Brick go out in carload shipments and the prevailing price is much higher than has been known in other years. An abnormal amount of brick building has been going forward since early spring and the receipt of large contracts indicates that there will be an increased volume of business during the fall and early winter.

Joseph Terteling has started the plant of the Idaho Brick Company at Lewiston, Idaho, which has been closed down since 1910.

The Hauerwas Brick Company will erect a plant at Florence, Ala., where they will turn out both a red and buff colored face brick

The Chicago Retort & Fire Brick Company is building a number of houses at Ottawa, Ill., for the use of their employes. All of the houses are of modern construction.

Contract has been awarded for the erection of an addition to the plant of the American Clay Machinery Company at Willoughby. The building will be one story, about 60x150 feet, and cost in the neighborhood of $30,000.

The Kaw Valley Brick Company, of Lawrence, Kans., under the new management of J. J. Simmonds, is again turning out its normal capacity of brick after its three years of inactivity. Forty men are employed in the plant with a payroll of more than $500 a week. Over a million brick have already been turned out at the capacity of 50,000 a day.

The General Refractories Co.'s plant at Olive Hill, Ky., has been closed for a couple of weeks on account of a strike which affects 500 men. The question in controversy is the recognition of the recently organized labor union and the refusal of the company to re-employ a few members of the union who were discharged some time ago.

Ernest Beutler has added a drain tile department to his brick plant at St. Cloud, Minn., and during the summer has hardly been able to take care of his drain tile orders. In addition to drain tile, he turns out an average of 2,000,000 brick every season. The Great Northern Railway Company has just completed a spur track into the yard, which will facilitate shipping.

The Metropolis Paving Brick Company is the name of a concern recently incorporated with a capital stock of $200,000 at Pittsburg, Kan., to erect an immense paving brick plant at that place. M. M. Bushong is president and manager of the company; Roy T. Collins, vice president; E. D. Tyner, secretary, and Andrew Jaicks, Jr., treasurer. The plant, which will have a capacity of over 1,000,000 brick per month, will be the last word in paving brick plants.

At the call of the board of directors, a special meeting of the stockholders, both common and preferred, of the Bickford Fire Brick Co., will be held on the third day of October, 1917, at the general offices of the company near the borough of Curwensville, Clearfield county, Pa., for the purpose of approving or disapproving of the purchase and taking over the Geo. S. Good Fire Brick Co. by the Bickford Fire Brick Co., to approve or disapprove of increasing the indebtedness, if any increase be necessary, of the Bickford Fire Brick Co., to a sufficient amount to enable it to purchase and take over the said Geo. S. Good Brick Co., if such action is determined upon, to approve or disapprove of changing the corporate name from Bickford Fire Brick Co. to Crescent Fire Brick Co.

BUILD WITH BRICK
THE EVERLASTING MATERIAL

Main Street, Lewisburg, Pa. Brick pavement filled with Barrett's Paving Pitch.

Barrett's PAVING PITCH

Where Every Joint is an Expansion-Joint

THE joints of this pavement are filled with Barret's Paving Pitch.

When the bricks contract in cold weather the pitch sinks a little lower in the joints, but never lets go of the bricks nor permits any crack or break in its waterproof seal.

That guarantees the foundation from frost or washout.

When the bricks expand on a hot day there is no pressure against curbs or manholes or street-car rails, for the pitch surrounding each brick is merely squeezed a little and rises slightly in the joints.

If some outside agency, such as settlement over a cut in the pavement not properly restored, cracks the waterproof seal, the pitch reunites and presently closes the gap automatically.

Pitch will last as long as the brick. It is impervious to the attack of water or weather or automobile-drippings.

When, after twenty or thirty years, the bricks are finally worn out and taken up to be replaced, the pitch will still be found clinging snugly to the brick.

Good municipal engineering demands that every joint be an expansion-joint. Curbs out of line, cracks, breaks and blow-outs, and troublesome expansion-joints are not unforeseeable misfortunes, but are the inevitable results of an attempt to ignore nature's laws.

The standard pitch for paving is Barrett's Paving Pitch.

Look for the label on the barrels.

Booklets free on request. Address our nearest office.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis
Cleveland Cincinnati Pittsburgh Detroit Birmingham
Kansas City Minneapolis Nashville
Salt Lake City Seattle Peoria
THE PATERSON MANUFACTURING CO., Limited:
Montreal Toronto Winnipeg Vancouver
St. John, N. B. Halifax, N. S. Sydney, N. S.

Written for The Clay-Worker.

SEEN IN NEW JERSEY.

BRICKMAKERS IN NEW JERSEY are becoming discouraged with the labor problem and are closing down. One of the latest to shut down for the season is the No. 4 plant of the Sayre & Fisher Company, at Sayreville. This is the third or fourth plant this company has idle merely because it is impossible to secure sufficient labor to do the work. Other firms are operating only partial capacity. They are unable to secure sufficient men to do any more.

In the Perth Amboy section, there has been one season long search after labor, and in most instances they have failed to find it. The usual supply of labor has disappeared, some of the men have been called home to fight, but most of them have entered more remunerative employment since other labor has been so scarce. A gradual moving up has been carried out and the man who formerly worked in the clay pits is now employed at better wages than this class of labor can afford to pay and the clay pit remains idle.

Along the Hackensack small burnings are in the kilns, but no great effort is made to lay up large ones. Coupled with the labor shortage is a difficulty in obtaining fuel which has hampered operations in this vicinity to some extent. Nor is it solved yet. Some of the yards secured wood, but that has to be shipped in by train and the shortage of cars at a time when the fuels should have been shipped prevented very much of this. With both labor and fuel hard to get Hackensack manufacturers have operated very conservatively all the season. Now that brick have dropped they see less incentive than before to undertake to do business and several of the yards are doing nothing.

Because of falling off in building activities all over the East the price of brick has declined until it is possible to buy common at around $8.25 per thousand. When the cost of labor and fuel and the difficulties which accompany manufacture this year are considered that figure is too low to be profitable and unquestionably this is exerting some influence upon the manufacturer when he is deciding to whether to lay up another burning or not. Demand for building purposes is light, though perhaps better than it has been for the past few weeks.

At Paterson the building operations are but a small fraction of what they were last year at this time. A number of large mills are now in process of erection and are consuming considerable quantities of brick, but no new ones are on the boards and dwellings are principally of some other material. The general tendency to postpone action until some time that seems more propitious seems a general characteristic. But on the other hand one finds that no apartments are vacant in the city and many more could be rented if they were available. The new mills, when they start, will force the erection of many new dwellings, or apartment houses because no room is now available for the help. Everything is filled now, excepting houses in the remote sections, too far away to allow employes to occupy them.

Newark is in a position which will make building investors wake up to their opportunities shortly. One of the largest ship building plants in the world is to be laid out on the Newark meadows. When in full operation it will employ upwards of 15,000 hands. Good authority says that not a house in Newark is now available, and apartments ample for the requirements of the families of this army of workmen will have to be built. This makes the building situation of interest in Newark when it is uncertain almost everywhere else.

Rudolph Kranz will shortly have his new brick plant ready for operation at Lyndhurst. He is rebuilding the New Jersey Brick Company's plant which was destroyed in the explosion of the Canadian Car and Foundry Company some months ago. While it is not so large as the old one Mr. Kranz is confident that the business done will be satisfactory. He was the former owner's agent in Paterson and succeeded in selling his share of brick offered. He hopes now to be in position to take good care of his customers through the control of the selling as well as the manufacturing end.

The Hackensack Brick Company, at Hackensack, is about the only one in that vicinity which has worked steadily through the summer. But it has been fortunate in securing labor. Furthermore, it has succeeded in disposing of its product at substantial profits. George M. Brewster, the general manager, has a wide acquaintance among buyers of brick. The answer is seen in the steadily mounting sales. It will require some time to fill the orders now waiting for this company's brick.

The Merhoff interests at Little Ferry are operating only a portion of their capacity, but what they have at work are employed continuously. The situation is not altogether such as they would like to see, but it is not bad and they are confident that plenty of business will follow the temporary lull. The total capacity is about 15,000,000 a year, but not one-fifth of that will be turned out this year.

When asked whether he expects a revival in building operations next year a gentleman whose experience in varied lines is wide declared that building will equal the most prosperous years as soon as the United States catches its breath; that while today it looks as though no end is possible as matter of fact the end is approaching and sometime everyone will wake up to the fact that it is over and that rehabilitation must begin. When that time comes brick men will see a good demand for their product, not because the American-made brick are to be sent abroad, but because all activities of that character will be stimulated. Conditions are such that everyone moves with extreme caution, but that spirit is likely to pass any moment and a regular orgy of expenditure begin. It is then that builders will have an opportunity to do business, and they will buy more brick than ever before.

Judge Adrian Lyon, of Perth Amboy, has been appointed receiver for the Raritan Clay Company, located at Woodbridge. The assets are given as $175,000 and the liabilities $102,000. The necessity for a receiver was created by the lack of working capital. It is hoped that the proceedings are only temporary and that means will be provided for the concern to resume business shortly.

The Enamel Brick and Tile Company, of Old Bridge, has begun the erection of a new kiln. The design is different from the old and experts believe that a way has been found to prevent the cracking of the glaze while burning, which has always caused a good deal of trouble. AL. B.

New MAGAZINE OFFERS

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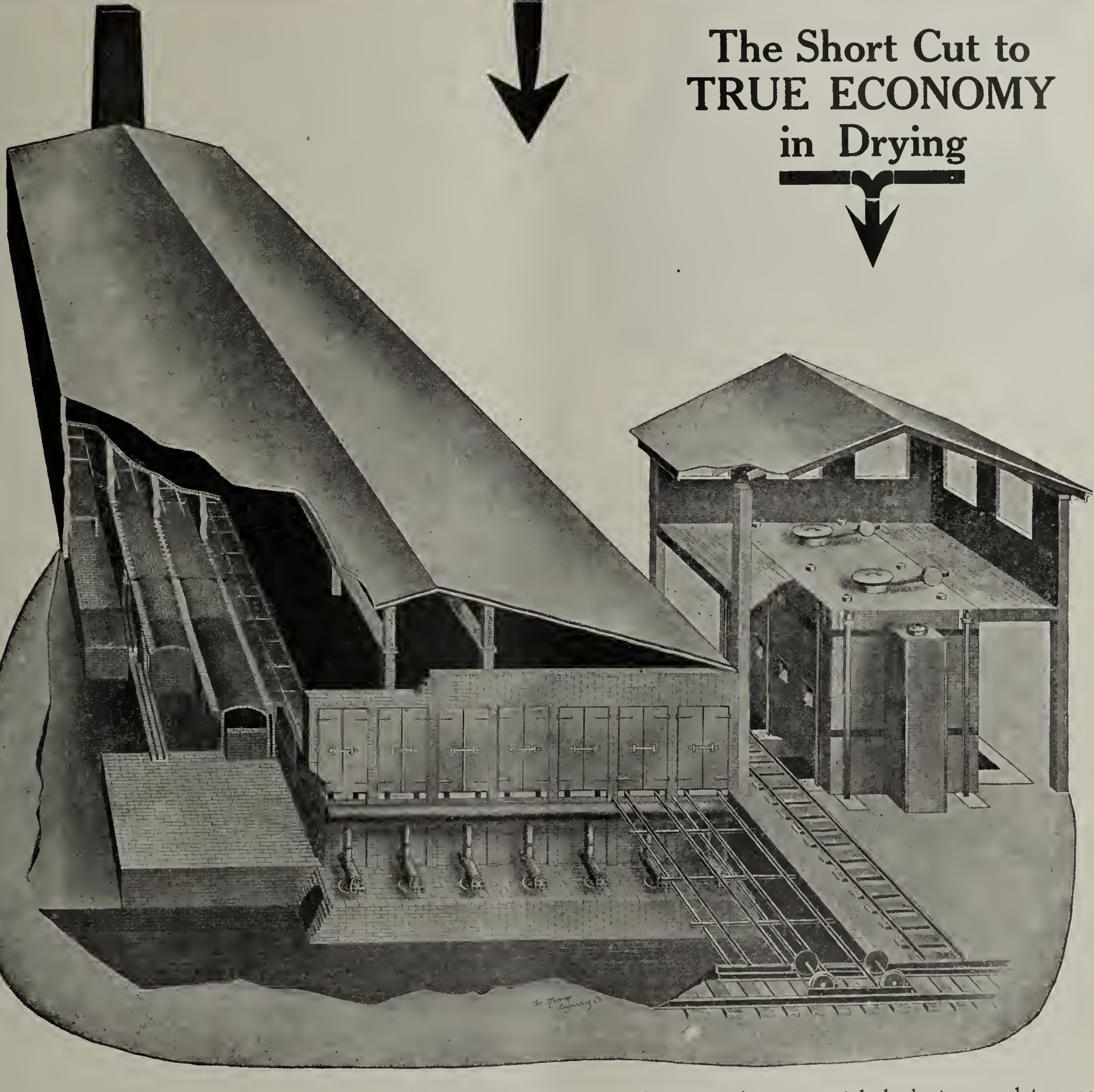

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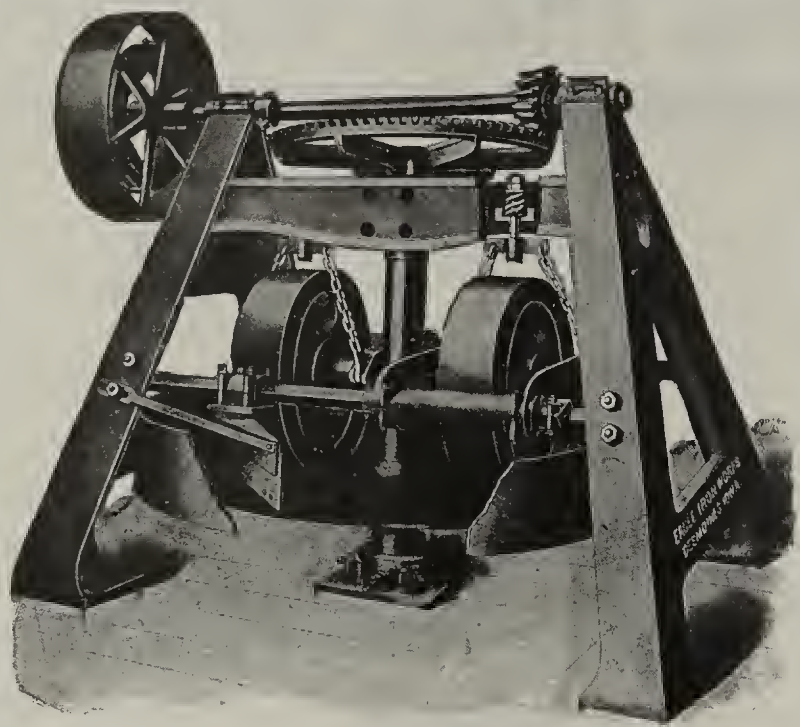

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T. A. Randall & Co., Indianapolis, Ind.

Written for THE CLAY-WORKER.

EVANSVILLE AND SOUTHERN INDIANA NEWS.

BRICK MANUFACTURERS at Evansville and other towns and cities in southwestern Indiana, report trade rather dull at the present time. As one manufacturer expressed it a few days ago, "trade is all shot to pieces now and no one seems to know when it is going to change for the better." Little building is now going on in Evansville as compared to other years. While architects and contractors express the hope that there will be some building this fall, few contracts are now being let. The contract was let a few days ago for the new Junior High School building at Evansville. The structure will be built of brick and it will cost in the neighborhood of $200,000. The contract has also been let for the new Blankenburg school at Evansville, which is to be built of brick at a cost of $58,000. Evansville manufacturers report that their out-of-town trade has been fairly good all season. The Standard Brick Manufacturing Co. of Evansville has had several contracts this summer at Vincennes and also some business in Chicago, having had the contract to furnish the brick for a school building in that city. John Andres, secretary and treasurer of the Standard Brick Manufacturing Co. says the outlook for trade is uncertain. "Our jobber in Chicago writes us that the brick business at this time is about seventy-five per cent. off," said Mr. Andres. "We are furnishing the brick for the Eagles' Home at Mt. Vernon, Ind., and we have also furnished the brick for a school building at McLeansboro, Ill. The contract for a new school building at Elizabethtown, Ill., is also to be let in a short time. We are operating two of our plants here on full time and are doing our best to keep busy."

The new brick addition to the factory of the Reddinger Furniture Manufacturing Co. at Evansville has just been completed at a cost of about $25,000. The Cottage Building Co. of that city is also building a new planing mill and warehouse. The brick home for nurses being erected by the Walker hospital at Evansville at a cost of $25,000 is expected to be completed by October 1st. The new administration building in the Oak Hill cemetery at Evansville is about completed. A new brick fence around the cemetery has just been finished. The fence is a mile long. Brick fences are something new in southern Indiana, although they are said to be very common in the East. A new administration building is also in the course of erection in St. Joseph's cemetery at Evansville. The new building that is being erected by the Bierhaus Wholesale Grocery Co. at Vincennes is expected to be completed about January 1st, at a cost of $90,000. The new school building being built of brick at Boonville, Ind., will be completed by January at a cost of $50,000. This building will be of brick with stone trimmings. A new brick school building at Decker, Ind., has just been completed at a cost of $50,000. A new high school building at Providence, Ky., is in the course of erection. The structure is of brick and will cost in the neighborhood of $25,000. Plans have been drawn for a new building for the American National Bank at Mt. Carmel, Ill.

The Kleymeyer and Klutey Co., of Henderson, Ky., is furnishing the brick for a new tobacco warehouse for Edward Hodge at Owensboro, Ky.

H. C. Kleymeyer, general manager of the Standard Brick Manufacturing Co., of Evansville, was the guest a few days ago of the Evansville Furniture Manufacturing Co. on their annual outing on the Ohio river. Mr. Kleymeyer is a large stockholder in a desk factory at Henderson, Ky.

Booneville, a live city of 5,000 people a few miles northeast of Evansville, has just completed its first brick street. The street is one of the best to be found in any city the size of Booneville in the state and it is expected the city will construct other brick streets in the future.

Lee Brenner, connected with the Cannelton Clay Products

Co., of Cannelton, Ind., returned a few days ago from a trip on the road in the interest of this well known company.

G. C. Landgrebe, superintendent of the Dry Press Brick Co., at Huntingburg, Ind., announced a few days ago that the company had made a voluntary raise of ten per cent. in the wages of all the men employed at the plant to enable them to meet the increase cost of living. The plant is being operated on full time.

Work has started on the re-building of the First Methodist Episcopal church at Vincennes, Ind., to take the place of the one recently destroyed by fire. The structure will be of brick and will cost $90,000.

The Home Mining Company, with a capital stock of $5,000, home office at Bloomfield, Ind., has been incorporated. The company will mine for clay and other ores. The directors are Philip J. Harrah, Lee H. Jones and Edward Stein.

Schmidt and Renner, of Tell City, Ind., have been awarded the contract for the building of two new additions to the plant of the Jasper Manufacturing Co. at Jasper, Ind. One addition will be 65 by 145 feet and the other one 35 by 85 feet. Both additions will be built of brick.

A short time ago bids were opened for the construction of three miles of brick streets at Grayville, Ill., a few miles west of Evansville. The contract was let to J. R. Crews, of Fairfield, Ill., his bid being the lowest. It was $133,123.87. Work on the improvement has started.

The appointment of William S. Moore, city engineer of Grand Rapids, as state highway engineer of Indiana, gives eminent satisfaction to the brick manufacturers throughout the state. Mr. Moore is a graduate of Purdue University at Lafayette, Ind. Mr. Moore went to Grand Rapids about the time that city was ready to plan the construction of a million dollar sewage disposal plant. He also faced two big sewer construction jobs. Mr. Moore's plans for the big sewer jobs and for the sewer disposal plant are on file in the city hall at Grand Rapids and will be worked out as soon as the money has been provided. Mr. Moore's specialty in Grand Rapids was street work. He gave the city the best engineering in the city, it is said, and he placed a great deal of brick work.

The Standard Brick Manufacturing Co. will furnish the brick for the new First Baptist church at Evansville that will be built at a cost of over $50,000. The contract for the building has been let to the M. J. Huffman Construction Co.

Brick manufacturers of southern Indiana are interested in the proposed market highway from Evansville to New Albany, Ind., a distance of 160 miles. Several members of the Indiana State Highway Commission visited southern Indiana last month and went over the proposed highway and was well pleased with the route.

The Ohio river wharf at Evansville has been in bad condition for several months past and it would be a splendid thing to pave the wharf with brick as it is agreed that this sort of improvement would last for a number of years and there could be none better. Brick manufacturers and contractors in Evansville will agitate the matter, it is announced.

A HOOSIER.

She Had Read All of Scott.

"Are you fond of literature?" he asked.

"Passionately," she replied.

"Then you must admire Sir Walter Scott," he exclaimed, with sudden animation. "Is not his 'Lady of the Lake' exquisite in its flowing grace and poetic imagery?"

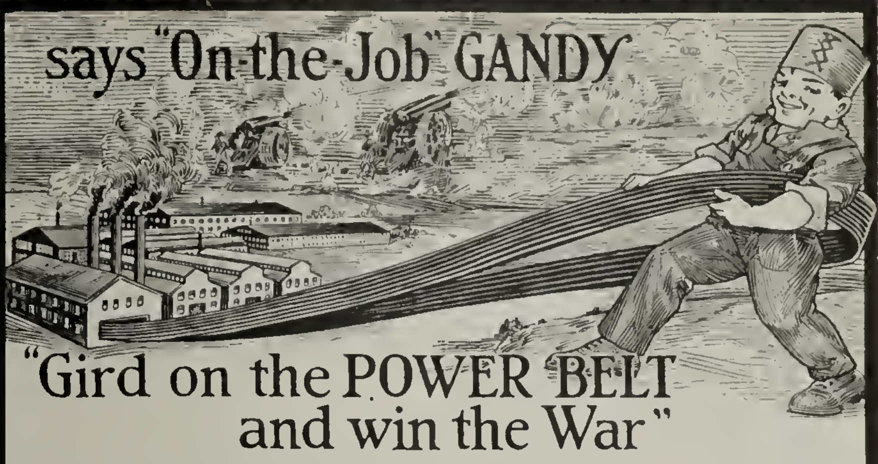
"It is perfectly lovely," she assented, clasping her hands in ecstacy. "I suppose I have read it a dozen times."

"And Scot's 'Marmion,'" he continued, "and 'Peveril of the Peak?'"

"I just dote upon them," she replied.

"And Scott's Emulsion?" he continued hastily, a faint suspicion dawning on him.

"I think," she interrupted rashly, "that it's the best thing he ever wrote."


says "On-the-Job" GANDY
"Gird on the POWER BELT and win the War"

"It's America's industries, three thousand miles back of the first line of defense, that are scheduled to deliver the knockout blow to Mars.

"It is YOUR plant and your mill, and your mine Uncle Sam looks to. And it is upon lieutenants such as I, 'On-the-Job' GANDY, the original stitched cotton duck POWER belt that you can depend to make every revolution of shaft, wheel and cog do its full duty.

"The industrial world has 'counted on me' for over 37 years. You can count on me now during the stress of forced production to get ALL THE PULL FROM THE PULLEY—to pick up and deliver every ounce of power.

"Warning! Don't run the risk of having your plant crippled by tied-up traffic. Remember what lack of equipment did for the British army at the beginning of the war, and get your orders in now for your belting requirements, ordering either from your jobber or factory direct."

The painted green edge and well known GANDY trademark are the "identification tags" of the POWER belt. Look for them.

Samples and prices on request.

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Use either waste heat or exhaust steam.
No live steam. No direct firing.

BOSS SYSTEM OF BURNING BRICK

Applies to all types of kilns and will save HALF in your cost of burning.

Let us save Time and Money for you

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YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

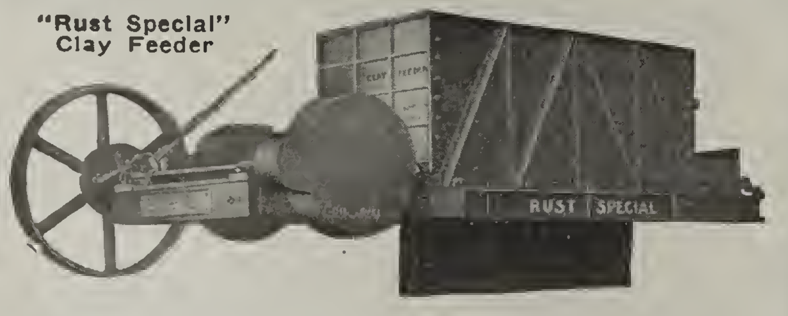
They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.

Tempers Clay Perfectly—Improves Product—Speeds up Plant

"Rust Special" Clay Feeder



Will help you get full capacity out of your dry pan, pug mill auger—insure a regular delivery to your offbearers, and also cuts out labor of two men.
Ask for Rust Bulletin.

MARION MACHINE, FOUNDRY & SUPPLY CO.
P. O. 156, MARION, IND.

WANTED

An experienced dry press man to operate my plant. Have a Ross-Keller four-mold dry press and 9-ft. Frost dry pan. Capacity of plant is 20 M per ten hours. A million brick have been sold in this town the past four months, and the profit on these brick would be $5,000.00. To a good reliable party I will sell half interest in my plant for $5,000.00, he to manage and operate plant at good salary. Close by towns furnish excellent markets for brick. For further particulars, Address,

OKLAHOMA,
Care Clay-Worker.

THE CLAY-WORKER

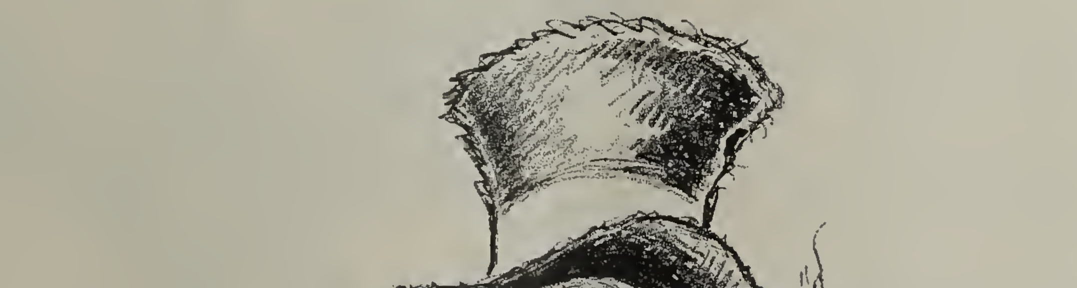
The Official Organ of the National Brick Manufacturers' Association of the United States of America.

Vol LXVIII. INDIANAPOLIS, IND., OCTOBER, 1917. No. 4

THE LIBERTY BELL RINGS AGAIN.

This Time for World Liberty and Freedom from the Tyranny of Militarism.

ONCE MORE THE LIBERTY BELL, which first tolled for American freedom in 1776, rings out a message of liberty, and this time it is world liberty, freedom from autocracy for the oppressed of all nations. It required great courage on the part of the patriots of 1776 to declare independence of their former rulers, and that independence was gained only after unspeakable hardships, which culminated in the dreadful winter at Valley Forge. By their sacrifices America was made the haven of refuge for the oppressed of all nations. Men and women with the love of liberty in their hearts, and brave enough to seek better conditions of life among strangers, have found here opportunity that was denied them in their native land, and so our nation has grown in population and wealth until now, but a century and a half since its birth was heralded by the old Liberty Bell, it is the richest nation in the world, rich not alone in its dollars, but in the intelligence and strength of its citizenship.



Uncle Sam Says, "All the Kings in the World Can't Beat This Hand."

Prosperity has been so long our lot that we have grown to be a nation of easy going, luxury-loving mortals, giving scant thought to aught but our business and our pleasures. We have waxed rich and soft, and so, until aroused, were easy marks for the scheming Teutons, who foolishly thought to rule the world through right of might. We have been slow to believe that there was an intention to force German militarism upon us, but recent developments are convincing on that score. It is quite plain to us all now that we must play our part in the war of democracy against plutocracy. As a nation it is our duty to go to the defense of human liberty with all our great wealth of men and money; the one must follow the other. It takes a vast sum of money to equip, feed and operate an army and navy such as the present war requires, but that the masses will arise to the occasion and supply all that is needed, is a certainty.

The young men of the nation have answered the call to service and stand ready and willing to give their lives, if need be, to rid the world of military tyrants. It is up to those of us who because of age or other reasons are unable to render active service to furnish the sinews of war for those who do. The government is asking for the loan of three billions of dollars or more. That it will be forthcoming at once there is little doubt. The second Liberty Loan will be over-subscribed as was the first, because every loyal citizen, whether native or foreign born, will do his full share. Self-interest, no less than patriotic interest, is assurance of that. The war must be carried to a victorious end, whatever the cost, and it will be, and our Liberty Bell will soon ring out again the glad song of liberty, and this time it will be world liberty that, it is devoutly hoped, will last to the end of time.

The Liberty Loan will be over-subscribed for business reasons no less than for patriotism, for it is both a good investment and a safe investment. It will spell war efficiency, national safety and business success. The Liberty Bonds will prove a safe investment for those of little means as well as for the rich, for the working man as well as for the capitalist.

Terms of Liberty Bonds and How They May Be Obtained.

Readers of The Clay-Worker who are not familiar with such an investment may be glad to know all the particulars as to the terms under which the bonds are issued, so we quote Secretary McAdoo:

"The second series of Liberty Bonds, known officially as 'United States of America 4 per cent. convertible bonds,' will run for a period of twenty-five years to November 15, 1942, subject to redemption at the option of the government at par and accrued interest on and after November 15, 1927. The bonds will bear interest from November 15 of this year and the interest will be payable on May 15 and November 15 each year.

"The exact amount of bonds to be issued under this offering will depend on the amount of subscription received. It is, of course, to be expected that subscriptions considerably in excess of $3,000,000,000 will be received, and in that event the right is reserved to allot bonds in excess of $3,000,000,000 to the extent of not over one-half of the sum by which the subscriptions received exceeds $3,000,000,000.

"In other words, if subscriptions to the extent of $5,000,000,000 are filed, $4,000,000,000 of bonds may be allotted.

"The bonds will be offered as before at par and accrued interest, and will be in denominations of fifty dollars and multiples thereof.

"The bonds shall be exempt, both as to principal and interest, from all taxation now or hereafter imposed by the United States, any state or any of the possessions of the United States or by any local taxing authority except (a) estate or inheritance taxes, and (b) graduated additional income taxes, commonly known as surtaxes, and excess profits and war profits taxes, now or hereafter imposed by the United States, upon the income or profits of individuals, partnerships, associations or corporations.

"The interest on an amount of bonds and certificates authorized by said act, the principal of which does not exceed in the aggregate $5,000, owned by any individual, partnership, association or corporation, shall be exempt from the taxes provided for in clause (b) above.

"If a subsequent series of bonds (not including United States certificates of indebtedness, war certificates, and other obligations maturing not more than five years from the issue of such obligations, respectively) bearing interest at a higher rate than 4 per cent. per annum shall, under the authority of said act approved September 24, 1917, or any other act, be issued by the United States before the termination of the war between the United States and the imperial German government (the date of such termination to be fixed by proclamation of the United States), then the holders of the bonds of the present series shall have the privilege, at the option of the several holders, of converting their bonds at par into bonds bearing such higher rate of interest at the issue price of bonds of such subsequent series, not less than par, with adjustment of accrued interest.

"Such conversion privilege must be exercised, if at all, at any time within the period, after the public offering of bonds of such subsequent series, beginning at the date of issue of bonds of such subsequent issue, as such date shall be fixed in such public offering and terminating six months after such date of issue, and under such rules and regulations as the secretary of the treasury shall have prescribed.

—Courtesy National Industrial Conservation Movement.

The Biggest Gun in the War for Democracy.

"The bonds to be issued upon such conversion of bonds of the present series shall be substantially the same in form and terms as shall be prescribed by or pursuant to law with respect to the bonds of such subsequent series, not only as to interest rate, but also as to convertibility (if future bonds be issued at a still higher rate of interest) or non-convertibility, and as to exemption from taxation, if any, and in all other respects, except that the bonds issued upon such conversion shall have the same dates of maturity, of principal and of interest, and be subject to the same terms of redemption before maturity, as the bonds converted; and such bonds shall be issued from time to time if and when and to the extent that the privileges of conversion so conferred shall arise and shall be exercised.

"If the privilege of conversion so conferred shall once arise and shall not be exercised with respect to any bonds of the present series within the period above prescribed, then such privileges shall terminate as to such bonds and shall not arise again, though again thereafter bonds be issued bearing interest at a higher rate or rates than 4 per cent. per annum.

"Subscription for the bonds must reach the treasury department, Washington, D. C., a federal reserve bank, or branch thereof, or some incorporated bank or trust company in the United States (not including outlying territories and possessions) on or before the close of business October 27, 1917.

"The application must be accompanied by a payment of 2 per cent. of the amount applied for, and subsequent installments upon bonds allotted will be due as follows:

"Eighteen per cent. on November 15, 1917.

"Forty per cent. on December 14, 1917.

"Forty per cent. on January 15, 1918.

HUMAN FREEDOM SHALL NOT PERISH FROM THE EARTH

"When we have obeyed the higher call, and have done our duty to the utmost, we may listen with good conscience to the agreeable truth that the Liberty Bonds, as a business investment, are exceedingly profitable. We do not spend or give away our money. We lend it to the United States Government, getting in return bonds secured by all the tremendous resources of the richest nation on earth. On this loan we get 4 per cent. interest. The bonds, in all probability, will sell at a large premium before maturity. Bonds at the same rate as these have sold as high as $130. Liberty bonds are the safest investment in the world. Your money will not be tied up beyond your reach. You can sell the bonds or borrow money on them at any time, therefore all your money can be put into Liberty Bonds. The future of your children can be insured by them. If you have no capital on hand, buy as many Liberty Bonds as you can pay for in installments out of current earnings. Reduce expenses if necessary, in order to put the money into Liberty Bonds. It is the greatest privilege and opportunity before American citizens to-day."—Literary Digest.

"On the latter date, accrued interest on the deferred installments will also be payable.

"I am very glad to be able to announce that by authorizing the engraving of these bonds with only four coupons attached, instead of the full number of fifty coupons, it will be possible to have the actual bonds ready for delivery as soon as full payments are completed, thus avoiding the trouble and delay incident to the issue of interim receipts or temporary bonds.

"On and after November 15, 1919, the holders of the bonds will have opportunity to exchange them for new bonds having attached thereto coupons for the balance of the period for which the bonds will run.

"It also is expected that on or about October 10, 1917, there will be in the hands of the several federal reserve banks a supply of these new bonds ready for immediate delivery to subscribers in amounts not in excess of $1,000 to any one subscriber against payment in full, thereby avoiding in such cases the trouble incident to waiting until after allotment for delivery.

"Plans also are being perfected whereby the banks all over the country can obtain bonds for the making of prompt delivery against these small subscriptions. As the bonds will bear interest from November 15 and as those who pay in full prior to that time will not obtain any interest on their money until that date, this is offered as an alternative proposition to those who are anxious to obtain immediate possession of the bonds for which they subscribe. The reason this offer will be limited to amounts of not over $1,000 to any one subscriber is that all subscriptions in excess of this amount will be subject to allotment.

"The campaign for the sale of these bonds will open Monday, October 1, and will close Saturday, October 27. I confidently hope that when the compaign is over it will be found that the total number of subscribers is at least 10,000,000 and the total subscription in excess of $5,000,000,000. Such a response would be notice to our enemies that the American people as a whole intend to support with all their power their government in the vigorous prosecution of this war and the achievement for an early and lasting peace."

In Partnership with Big Business.

Every man or woman who owns a Liberty Bond for $50.00 or more is to that extent in partnership with Uncle Sam; so the Liberty Bond affords us each and all an opportunity to be a part and parcel of big business—the biggest business in all the world. It should not be forgotten that on the results of the war will depend to a large extent the future peace and happiness of our children and our children's children. Buy a Liberty Bond, even if you have to pay for it on the installment plan, and so do your bit for liberty and right.

PUSH FIREPLACE WORK.

There is evidence already that this winter will be one of unusual turning to the fireplace and grate for heat and comfort. Because of the scarcity of coal many furnaces will be left out of commission or used only intermittently. More local heating of rooms will be the order of the day. In this local heating nothing is more homelike and desirable than a fireplace or the open grate, therefore it ought to be a splendid season for pushing the fireplace idea.

Fireplace work does not merely include fire clay products, but furnishes an opportunity to sell brick and tile and to encourage the development of the brick fireplace in the home. There is both art and comfort to be obtained in a brick fireplace, and the present occasion furnishes an opportunity that every clayworker should take advantage of by encouraging the fireplace habit among the home owners.

Meantime the return to stoves will make the call in many instances for chimney flue brick and flue lining, so that taking it all around this fireplace and chimney trade should be an item of more importance this winter than ever before.

MONOLITHIC BRICK PAVED COUNTRY ROADS.

Their Value to the Union Today and a Treatise of Their Construction, Showing Merits and Advantages.

THE fact that the enormous crop yields must be marketed, together with the knowledge of the shortage of railway transportation facilities, is focusing the eyes of America more and more on the rural roads leading from the farms to commercial centers and shipping points. The railroads have a huge problem before them, with the great demands of the government for transporting troops, supplies, etc., and the unusual shipping requirements of the manufacturing and business concerns. The railroads cannot furnish large numbers of cars for the use of the smaller communities, so that prompt attention must be given to the delivery of the farmers' products to these collecting stations. The individual farms are not connected with the railroads, so the immense crop must be hauled over country highways to the nearest shipping point. With the great need for promptness in this particular, not only for securing early shipments of perishable goods, but the expense incurred, the farmer is greatly assisted or greatly handicapped if the roads leading from his farm to these points are in good or bad condition.

While there are some good stretches of country roads in most rural districts, there is a dire need for improved roadways almost everywhere. In this era of better road building, the advocates of vitrified brick for paving are glad to see that material continuing to hold its own. The merits of paving brick, which make it a superior road material, are becoming better understood and appreciated, so that the mileage of brick-paved country roadways is constantly increasing with a better ratio than in the past.

When you find brick-paved country roadways you find prosperous and contented families, for this type of road permits easy hauling and a more rapid disposal of farm products. Good roads reduce the time of hauling to a minimum and permit the handling of a greater load on every trip. The horses have a better foothold and the pull is much lightened. Mudholes or gravel pits are a thing of the past where the country roadway is paved with brick.

The maintenance is nil, and, properly laid, the road will last for generations. Constructed as they are today, in widths of 9 to 15 feet, the expense is greatly reduced over city pavements or macadam roads, with their constant repair bills. Brick roads are good in all kinds of weather, and especially are they appreciated by the farmers during the windy days, because they are free from dust.

We had the pleasure recently of making a trip into Edgar county, Illinois, from Terre Haute, Ind., in company with Will P. Blair, secretary, and Maurice B. Greenough, chief engineer of the National Paving Brick Manufacturers' Association. We rode over many miles of monolithic construction of brick pavements in and about Paris, Ill., and were pleased to find how well satisfied and thoroughly enthusiastic the farmers and tourists were with and concerning this ideal road construction.

There are over eight miles of monolithic brick roads and nine miles of the old type in Edgar county. This section of Illinois has been responsible for the increased demand for brick paved road construction in that state, for the monolithic type of brick roadway was first built there, and the work done so well and satisfactory that its value was not long unappreciated and the facts were soon spread broadcast. The counties of Edgar, Coles and Piatt have been most active in the construction of monolithic roads. All the brick roads built in the state by the State Highway Department since this type of road was developed have been monolithic. Their specifications now require it. The longest stretch of brick road in Illinois is in Vermillion county, extending from Georgetown to the north Vermillion line. This will be twenty miles or more in length. There are quite a few sections in the state five to ten miles long, the width of same varying from 10 to 18 feet.

A treatise on the monolithic type of brick paved roadways appeared recently in the Municipal Engineering, under the head, "The Recent Revision of Ideas About Brick Pavement Construction," and is so good that we reproduce it in full for the benefit of our readers:

Methods of building brick roads have undergone radical changes during the past two years. Types of construction have changed and fundamental ideas have been revised. Two distinct advantages have resulted: Better roads are being built and with less material than the old types required.

Passing of the Cushion.

Formerly a sand cushion between the artificial foundation and the brick surfacing was considered necessary in order to afford an even bearing surface for the brick and to give the resilience theoretically assumed to be required for absorbing and distributing the shock of traffic. Formerly, also, the artificial foundation was regarded as the chief factor in the load-bearing strength of the pavement. Experience and experimental tests have demonstrated the fallacy of both theories.

The rigid type of construction, in which the brick surfacing and the artificial foundation are united in a single beam, has doomed the sand cushion to the discard. It is now known that the brick surfacing, if properly bonded with cement-grout filler, is the real load-bearing part of the pavement, and that the chief function of the artificial foundation is to afford a stable, even bearing for the brick.

The State Highway Department of Illinois has laid a considerable mileage of brick on a 1-inch concrete foundation. Many engineers are constructing brick roads with concrete foundations 2 inches and 3 inches deep, instead of 6 inches, as formerly. In other instances 1 inch of cement-sand mortar is used as a bed over old macadam or on gravel soil or road.

Monolithic Brick Pavements.

Of course, in every case in which a shallow concrete foundation is used, the monolithic type of construction is employed. The brick are laid in the wet concrete and are bonded with cement grout filler.

Experiments conducted during the year 1916 to determine the relative resistance to load stresses of brick surfacing and concrete foundations disclosed that with monolithic construction the brick actually lend strength to the foundation, and so also was revealed the fact that the brick hold the concrete foundation so firmly that the expansion and contraction of the latter coincided with the expansion and contraction of the brick, although when experimented with separately concrete and brick showed marked variations in expansive ranges under heat and moisture influences.

Doubtless the fact that concrete foundations are protected from heat and moisture by the brick surfacing accounts in great measure for the equalizing of the respective coefficients of expansion under the practical conditions established by pavement construction; but the assertion, based upon a series of experiments conducted under the most careful safeguards, that in the brick surfacing resides the main load-resisting strength of a pavement, confirms the contention of proponents of rigid brick pavements that such pavements are the strongest general purpose pavements that can be constructed.

The virtual invulnerability of vitrified brick to abrasion and moisture was already established by the history of hundreds of brick pavements, but until recently the need of a deep foundation was generally conceded.

Now that laboratory tests and practical service tests have proven that a 4-inch green concrete foundation, with a 4-inch vitrified brick surfacing, give a much stronger pavement than was formerly obtained by the use of a 6-inch concrete foundation, a 1½-inch sand cushion and a 4-inch brick top, the cost of brick pavements, allowing for no change in cost of labor and materials, is materially reduced.

The reduction in cost is made greater by the fact that monolithic construction of highways eliminates flush side edgings and curbs, while the rapidity with which monolithic pavements can be constructed effects an additional saving in the item of labor costs.

In many instances a 3-inch brick of the wire-cut lug type, instead of a standard 4-inch wire-cut lug brick, is used on a 4-inch green concrete foundation, or upon a 4-inch set-up foundation with a 1-inch cement-sand bed for a superfoundation, which binds the brick to the foundation and makes the pavement a single rigid beam from surface to sub-base or natural soil. These brick are used because of their superior bonding strength and square edges.

Advantages of Monolithic Pavements.

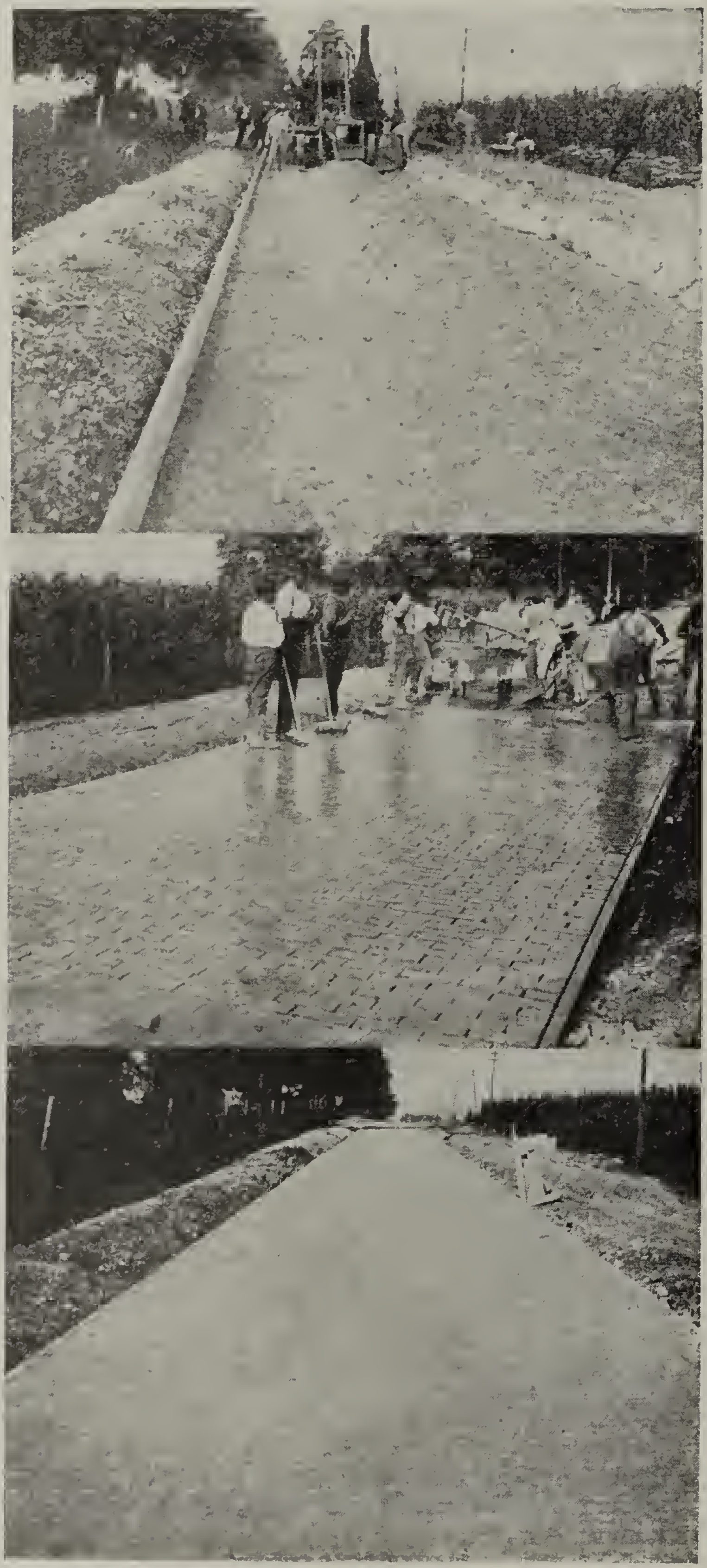
The monolithic and semi-monolithic types of pavement—as the green concrete foundation and the cement-sand bed types are called, respectively—are solid, practically noiseless, smooth, sanitary and durable. They originate no dust or dirt, are easily cleaned, and are not in any way affected by motor-vehicle, iron-tired vehicle traffic, or by surface moisture. A well-constructed brick pavement of either type neither becomes wavy nor slippery, nor pits, ruts, ravels nor disintegrates. It remains smooth and even on the surface and is good for all kinds of traffic.

Monolithic brack pavements are now used almost exclusively for brick highways in several states, including the states of Indiana and Illinois. The principle of the rigid beam from

Views of Monolithic Brick Paved Roads Near Paris, Ill. Upper Left—Maurice Greenough, Our Redoubtable Jitney Driver. Upper Right—Mr. Blair Snaps Some Pictures. Lower Left—Brick Roads Make Heavy Loads Light for Horses. Lower Right—Corn and its Best Road to Market.

surface to sub-base has been found scientifically sound and advantageous from the construction standpoint.

An additional advantage is that inasmuch as all phases of the work are going on at the same time within a distance of 50 feet, the engineer in charge can have all the work under his eye at all times. The contractor also can bring his organization to a high state of efficiency by concentrating and systematizing his work and by saving the time ordinarily required in going from one part of the work to another. In fact, the contractor, having all the work under his immediate supervision virtually at a single point, can very easily dispense with a foreman, provided that the contractor is able to devote all his time to the job in hand.



Views Showing Construction of Wire-Cut-Lug Monolithic Brick Highway, Edgar County, Ill.

In the South, notably in Florida, where the sand drains easily and can be compacted solidly by puddling, more than 100 miles of highways have been constructed with grouted wire-cut lug brick laid on a natural soil foundation. In these cases the monolithic brick slab has proven entirely adequate to sustain regular auto-truck traffic.

This object lesson gives additional confirmation to the opinion that, given a stable, even-bearing foundation, either artificial or natural soil, a well-bonded and smooth brick surfacing is the prime factor in the load-bearing capacity of a brick pavement.

Construction Features of Monolithic Pavements.

The constructional features of a monolithic pavement are a wet concrete foundation reduced to a true cross-section, upon which the brick are laid and immediately rolled, culled and grouted. The object is to obtain a single rigid beam, all parts of which are strongly united. In order to attain that end it is necessary to grout the pavement immediately after laying and rolling the brick, so that the grout filler, going to the bottom of the joints, shall form a homogeneous union with the green concrete foundation.

An essential feature, but one not always regarded in practice, is sprinkling the grouted pavement and keeping it covered with earth or straw for two or three days, so that the grout filler will not set too quickly and crumble.

Of course, as the concrete foundation is green, it is not feasible to use a heavy self-propelling roller for rolling the brick. A twin-cylinder hand roller, about 30 inches long, and weighing, when filled with water, about 800 pounds, gives the best results.

The green concrete foundation is brought to a true contour with either smoothing template or a tamping template designed especially for the purpose. Care must be taken in getting the surface of the foundation to the true contour of the surface of the completed pavement and at the right uniform depth below the surface contour. Care must also be exercised in assuring complete penetration of the grout to all parts of the joint and to the bottom of the brick, as strong bonding together of the brick and of the brick to the foundation are absolutely essential to good construction.

The foundation should be of proper consistency to bear up the brick when they are rolled, yet the moisture content should be sufficient to allow of easy shaping of the surface and to assure a perfect union with the brick surfacing. A foundation too dry is difficult to shape smoothly and it is liable to contain voids and lack uniform density.

No arbitrary rules can be laid down for mixing the concrete for the foundation. Each engineer must exercise discretion in the use of water, so that the concrete shall be of the proper consistency. A little experience or close observation will enable the engineer to fix the amount of water to use; but one detail cannot be neglected: The concrete must not be carried in a barrow for dumping; it must be put in place with the least possible chance for separation of the components.

Owing to conditions produced by the war it is not practicable to give reliable cost data for monolithic brick pavements. The length of hauls, the prices of materials and the price and available supply of labor are so unstable and they vary so much at different points, that estimates made for one point or for one period of time may not be serviceable at other points or at other times.

Quantitative Data.

Quantitative estimates are all that can be made with confidence at this time.

Wire-cut lug brick lay 40 to the square yard, or 25 square yards to the thousand. Assuming that a 4-inch concrete foundation mixed 1:3:6 is designed, approximately 0.123 of a barrel of cement would be required per square yard. For grouting, 1 to 1 mixture, the requirement per square yard is 0.037

of a barrel of cement. For a sand-cement bed, 1 inch thick, 1 to 4 mixture, designed for semi-monolithic pavement, 0.051 of a barrel of cement is used per square yard. The cost of sand or gravel depends upon the proximity of the supply and local market quotations.

There is a tendency on the part of some engineers to use a stronger mixture for both foundation and cement-sand beds, 1:2½:5 for the former and 1:3 for the latter. In that case it would require 0.144 of a barrel of cement per square yard for the base and 0.065 of a barrel of cement per square yard of area for cement-sand bed 1 inch deep.

WHAT FOOD CONTROL REALLY MEANS.

By James H. Collins, Editor, Trade and Technical Press Section, United States Food Administration.

SPEAKING RECENTLY at a meeting of State Food Commissioners and his personal staff, Herbert Hoover gave a striking explanation of the part that food control plays in war.

He said that European nations went into the war giving little thought to the subject of food. Even Germany, with all its preparations, had not foreseen the significance of this factor. With millions of men taken from production and thousands of square miles of fertile fields laid waste by armies, the world's cupboard quickly began developing a bareness like that of Mother Hubbard. Country after country went to the cupboard to get a bone, and found a diminished supply.

This made it necessary to organize food supply and distribution, and the various countries tried various methods. They fixed maximum prices and minimum prices, regulated the production and distributing trades, and put their people on rations. Those countries which established the earliest and best methods of food control secured the greatest efficiency in war. The best system, on the whole, is still that of Germany, and she has been able to maintain efficiency with a food supply which in some of her enemy countries might be most embarrassing. Russia, with perhaps the greatest possibilities of food production in Europe, did nothing at all, and out of Russia's food situation grew her revolution.

Mr. Hoover said that, whether we like it or not, we must deal with the food problem of war in one of two ways. There is not enough food to go around if we stick to the lavish methods of peace times. Rising prices, coupled with depreciation of money, due to issues of war bonds in every country, which make the purchasing power of money shrink, compel us to adjust the food supply to the world's appetite, either by controlling that supply in ways that lead to economy, and make it suffice, or by letting wages rise as prices rise, to keep pace roughly with fluctuations. Even an amateur economist can see at a glance that food control is better than wage increase, because wage increase is a crude force, operating slowly, unevenly and with great injustice and suffering to millions of workers. The wages of many workers do not rise—the professional men, clerical workers, public employes, and so forth. Russia tried the experiment of letting wages adjust themselves to the diminishing food supply, and it did not work; Russia was brought to a state bordering on anarchy by the intolerable pressure of the food situation on the ordinary peaceful citizen.

Therefore, whether we like it or not—this is a favorite phrase of the food administrator and typifies the impersonal attitude he takes toward these great economic problems—whether we like it or not, we must meet the food situation in one way or the other, and food control seems to be the lesser of two evils.

This viewpoint explains most of the work thus far done by the United States Food Administration. From August 10, when President Wilson signed the food law, until today, much of the work of the Food Administration has centered upon the organization of food control machinery. The farmer, the grain man, the miller, the baker, the packer, the grocer, the wholesaler and retailer, the traveling salesman and the canned goods broker, have gone to Washington in bodies representing the best men and the best minds in their respective trades, and have conferred there, not only with the food administrator himself, but with leading men in their own lines who are acting as volunteers on the Food Administration. Sometimes they have gone with fear in their hearts or resentment at the prospect of government interference in their business affairs. But there is something in Washington which quickly dissipates fear and resentment, and leads these men to offer their unanimous support to food control measures.

"Whether we like it or not," they are told, "this is the situation. Business cannot go on as usual in war times, because the law of supply and demand is thrown out of operation. These are the conditions and here is the only remedy that has been found in countries with greater experience in war than we have yet had. What do you think about it, gentlemen?"

What the business men think is shown in every case by their action in recognizing the necessity for food control. They have promised their patriotic co-operation, and are readjusting their trade organization and methods for loyal support of Food Administration policies.

With sensible food control it is possible to handle the other two outstanding problems of food supply in war. One is increased production and the other is economical use of food. With stable prices, absence of speculation and the temporary surrender of individual trade advantages, the farmer can have an assurance of prices ample enough to encourage larger planting and live stock raising. And by these same safeguards thrown round the food supply, the consumer is made willing to economize in food, and is also able to purchase the necessities of life at prices which are at least reasonable, and, what is more important, do not suffer wild fluctuations.

This is food control in a nutshell. Whatever fear or hostility there may be in the country over food control arises entirely from misunderstanding of what food control really means, why it is necessary and how it is being carried out. In no case does this feeling persist after real food control has been explained.

HENDRICKS' COMMERCIAL REGISTER FOR BUYERS AND SELLERS.

The twenty-sixth annual edition of Hendricks' Commercial Register of the United States for Buyers and Sellers has just been published. This standard publication is especially devoted to the interests of the architectural, contracting, electrical, engineering, hardware, iron, mechanical, mill, mining, quarrying, railroad, steel and kindred industries. Full lists are included of producers, manufacturers, dealers and consumers, listing all products, from the raw material to the finished article, together with the concerns handling these products, from the producer to the consumer. There are 2,209 pages of text matter and the index to trade classifications numbers 151 pages, covering over 50,000 trade references. The list of trade names, brands, titles of identification, etc., numbering 1,312 pages, furnishes ready reference to distinctive products manufactured by concerns listed in the work. The alphabetical section is included for the first time, and contains in one alphabetical list the name, trade description and address of every concern appearing in the book. S. E. Hendricks Company, Inc., 2 West Thirteenth street, New York City. Price, $10.00.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART XVII.

KILN TEMPERATURES.

Kiln temperatures are dependent upon the calorific value of the fuel, the radiation and stack losses, and the perfectness of combustion of the gases. In combustion the hydro-carbons are burned to water vapor and carbon-dioxide, the hydrogen to water vapor and the carbon-monoxide to dioxide.

We have in the gas:

CH_4	.0896
H	.0334
CO	1.0624

And in the available tar:

C	.0463
H	.0037

The oxygen required for the first item will be in the proportion:

$$\frac{.0896}{16} = \frac{x}{64} = \text{oxygen}$$

$$x = .3584 \text{ oxygen.}$$

The hydrogen requires oxygen in the proportion $\frac{.0334}{2} = \frac{x}{16}$ $x = .2672$ oxygen.

The carbon-monoxide requires $\frac{1.0624}{28} = \frac{x}{16}$ $x = .6071$ oxygen.

These three items include all the combustibles if the gas is burned cold and the total oxygen required is 1.2327 and the nitrogen accompanying will be 4.012. The reaction for CH_4 is $CH_4 + O_4 = CO_2 + 2\,H_2O$. The weight of CH_4 and O is .4480 and the CO_2 and $2\,H_2O$ will be $\frac{44}{80}$ and $\frac{36}{80}$, respectively, times this weight, and we find:

$$CO_2 = .2245$$
$$H_2O = .1837$$

The hydrogen produces $H_2O = .3006$.
The carbon monoxide gives $CO_2 = 1.6695$.

Summing up and including the inert gases, we have:

Water vapor	.0460
SO_2	.0594
CO_2	2.2277
N	6.3089
Excess air	1.3120
H_2O in air	.0138

Note: We use only the amount of water vapor in the cold gas instead of the amount which the coal would produce and as given.

We must now assume temperatures and determine the thermal capacities of these gases using the factors given in the ""Table of Thermal Capacities of Gases" previously presented.

The results are as follows:

	2230 deg.	2432 deg.
H_2O =	65	73
SO_2 =	32	37
CO_2 =	1577	1786
N =	4467	5060
Excess of air 25% =	752	828
Moisture in air =	19	22
	6912 B.t.u.	7806 B.t.u.

The cold gas less fuel for steam has value of 8785. If we assume 20 percent radiation loss we have remaining 7028 B.t.u. It is seen that the temperature is slightly above 2272 deg. for the cold gas with 25 percent excess air and 20 percent radiation loss. The total of the first four items under 2432 deg. F. is 6956, which would be the heat requirement at this temperature without any excess air, and this shows that the temperature will be above 2432 degrees if we burn the gas with the theoretical volume of air.

The hot gas has the following combustion products:

Water vapor	.6708
SO_2	.0594
CO_2	2.3975
N	6.8082
25% excess air	1.4743
H_2O in excess air	.0155

The hot gas, less fuel to generate steam has a value of 10410 B.t.u. and 20 percent radiation loss will leave 8328 B.t.u. We can now determine the heat requirement for the combustion gases:

	2432 deg.	2632 deg.	2832 deg.	3032 deg.
Water vapor	1063	1186	1315	1449
SO_2	37	42	47	52
CO_2	1923	2158	2402	2661
N	4398	4807	5222	5651
Total	7421	8193	8986	9813
Air	930	1017	1104	
Moisture	25	27	30	
Grand total	8376 B.t.u.	9237 B.t.u.	10120 B.t.u.	

We note from the first column that the combustion gases, including 25 percent excess air, require 8376 B.t.u., and we had available 8328 B.t.u. allowing 20 percent radiation loss. The possible temperature is therefore slightly under 2432 degrees. In the direct coal firing allowing 50 percent air excess and 20 percent radiation loss, we had a temperature of 2389 degrees. Just how much less excess of air would be required with the coal to make the gas and coal equal could easily be determined but the two results given are sufficiently close for comparison. In the second column of the gas combustion results, it will be noted that the temperature will be above 2632 degrees if we can eliminate the excess air but the temperature will not reach 2832 degrees as shown in the third column. If we can eliminate both the excess air and radiation loss or reduce them, the temperature will be above 3032 degrees as shown in the fourth column. The value of gas compared with coal depends entirely upon how much nearer we can approach theoretically perfect combustion, and how much we can reduce the relative radiation loss by burning a greater volume in a given time.

PART XVIII.—Kiln Stacks.

The proper size of a kiln stack is very uncertain and the general practice is a rule of thumb determination but without any specific rule of thumb.

A presentation of this problem with the data available will not enable us to show what is the proper size of a kiln stack but it may encourage clayworkers to secure additional data for calculations which will lead to better stack designs.

The problem has been pretty well solved for steam boilers and the results presented in tables from which we may select a suitable stack for any power but this problem is a much simpler one in that it deals with comparatively constant temperature and constant resistance while in a kiln stack these factors are variable.

We are burning in boiler furnaces a fixed amount of fuel per hour, or per foot of grate area, or per horse power, and developing a fixed amount of gas per unit of time. The temperature of the gas entering the stack is practically constant and is usually figured at the maximum efficiency temperature, 550 to 600 degrees Fahrenheit. We have a thin metallic shell which is a good conductor of heat and within this shell there is circulating water with its relatively high specific heat and constant temperature. The resistance in any given boiler is fixed and it is this resistance which the stack power must overcome and which determines the required height of stack.

Since the conditions are practically fixed and the engineer has only to consider different grades and characters of fuels, different climatic conditions, and the position of the stack relative to the boiler, but these introduce enough uncertainty to require serious consideration, and modification of the formulas.

In a kiln operation the quantity of fuel for hollow ware is increasing at a variable rate from start to finish of the burning and for bricks the quantity of fuel increases up to the soaking heat period during which it is fairly constant to the end of the burning except frequently a slight falling off toward the end. The ware has a low specific heat and is a poor conductor of heat. Moreover, the heat must be conducted from the surface to the center of the ware and the conductivity is variable. The ware must be brought to the proper temperature in all parts of the kiln. The escaping gases are doubly variable, increasing in volume with the quantity of fuel and with the temperature. The rate of fuel combustion is greater in burning hollow ware than in burning bricks but this is a small difference compared with the fuel requirement for different wares, the burning temperatures of which vary from cone 010 to cone 26. We are careful in increasing the furnace power for such variations but not equally careful in proportioning the stack.

Finally the resistance which the stack must balance is

(Continued on page 376.)

Written for THE CLAY-WORKER.

NEW YORK AND VICINITY.

THE SITUATION in New York remains substantially the same as it was last month. Yards are hampered by lack of labor, and where labor can be obtained shipping facilities are curtailed. Prices have ranged up to $12.00 for Hudson commons, and other grades in proportion. But even high prices fail to bring out the stock in some instances, because it is impossible to get the work done. Leading firms along the Hudson river are unable to do business because of lack of help.

In some respects the Hudson river makers are favored. Many of them own old schooners, which they have rehabilitated in instances and have done their shipping that way. They can get coal in by these vessels, too, when they are unable to get it over the rails. But even with all the makeshifts they have devised the situation remains acute and yards are closing because of the difficulties they encounter.

The Garner Brick Works, at Haverstraw, are arranging to put in a tractor to haul their cars of raw clay from the bank to the mill. The work is now done by team, and each car requires its horse and driver. Both men and horses are becoming so scarce that conservation is forced, hence the tractor. They intend making it do double work, since when it hauls the loaded cars to the mill it will at the same time haul the empty cars to the bank. It is the first application of tractors to this sort of work in this vicinity, and more than one clay man will watch the progress of the development with interest. The Garner works operate an all-year plant, consequently their introduction of tractor power means a saving larger than would show in other instances. They are bothered to get men to load their barges, and they figure that with a tractor doing their hauling they can release the men now driving horses for loading barges. They are behind with orders because they cannot get their barges loaded and cars loaded.

The building situation in New York is a little better than last month, but it is too late in the season for improvement to do much good this season. And no man can estimate what the coming year will bring forth. The situation now doesn't look especially promising. While much new building will be needed to keep pace with the city's normal growth, it seems, from what can be gathered, that few are ready to invest in important enterprises when material and men are so high in price. It would seem, therefore, that building in New York will not hold up to its usual standard next year, but after the war ends, and commercial affairs have time to become adjusted to new conditions, the operations here will be upon a scale such as has never been seen before. All authorities agree on that, but for the present they look for conservative action.

BURTON.

FIRE PREVENTION INFORMATION.

Our fire losses show a sharp increase this year, the total for the first seven months for the year 1917 being nearly $170,000,000, as against $148,000,000 for the same period last year. Higher property values account for part of this loss, but there is an increase in actual conflagrations.

To reduce fire loss in flour mills, grain elevators and other places where food is handled, the National Board of Fire Underwriters, 76 William street, New York, has prepared a booklet giving directions for the prevention of fires, under the title of "Safeguarding Industries," and a show card of fire prevention rules for employes. This booklet and copies of the show card will be supplied to any one upon request to the New York address given above.

HOLLOW TILE AND ITS VALUE IN THE BUILDING OF FARM STRUCTURES

The Iowa Hollow Tile Hog House.

THE Permanent Building Society of Des Moines, Ia., has been most successful in bringing to the attention of the farmers of Iowa and neighboring states the great importance of constructing farmhouses and other structures of burned clay products. This society has carried on a thorough proselytism by means of illustrated lectures before farmers' institutes and other specially called meetings, and a circulation of pamphlets and leaflets through the mail and otherwise. It has covered the field well in advocating the use of hollow building tile for nearly every type of farm structure. One of their most recent pamphlets is devoted to hog house plans, and we are pleased to reproduce a few of same, through the courtesy of the Permanent Building Society.

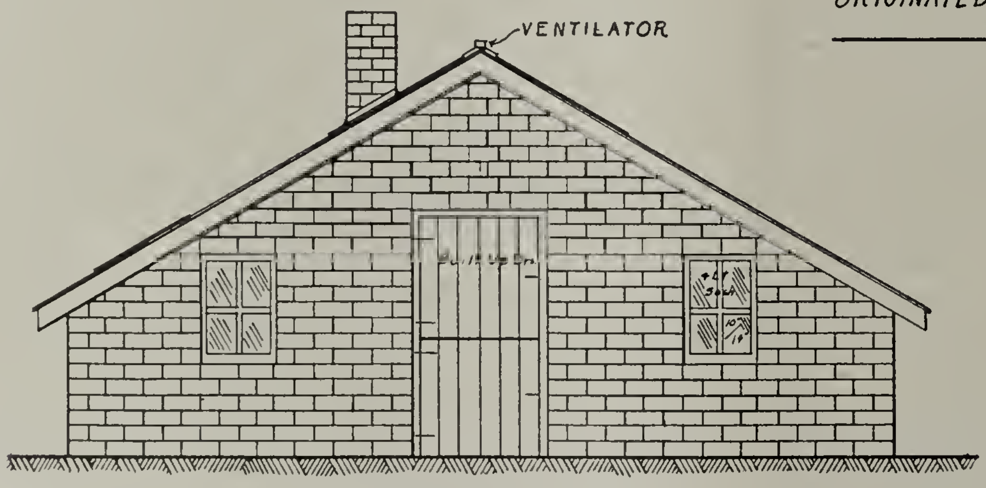
Many interesting points are made in the pamphlet under the following heads:

Save Your Pigs by Giving Them a Warm, Dry Bed.

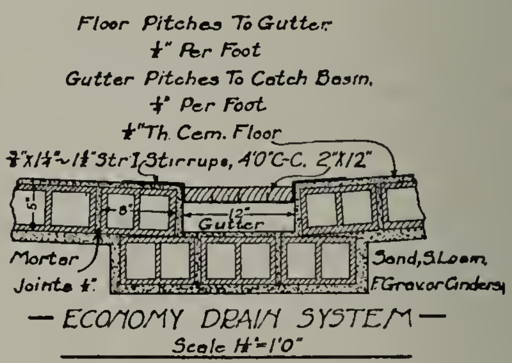
Burnable buildings rot. They harbor vermin and disease. Their upkeep is a constant source of expense.

For floors nothing but masonry materials can be consid-

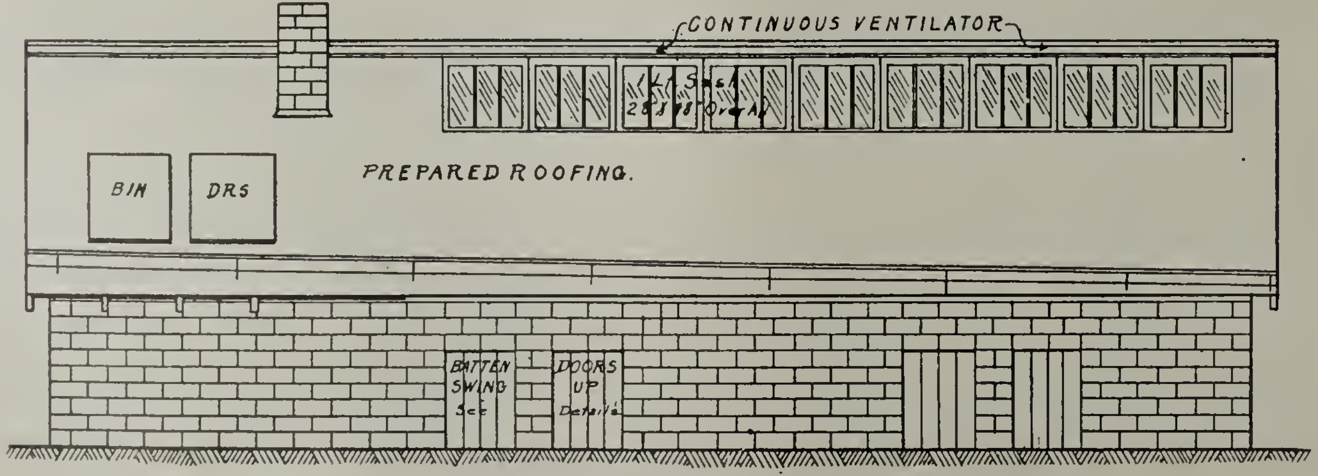
IOWA HOG HOUSE
ORIGINATED BY IOWA STATE COLLEGE,
AMES-IOWA.



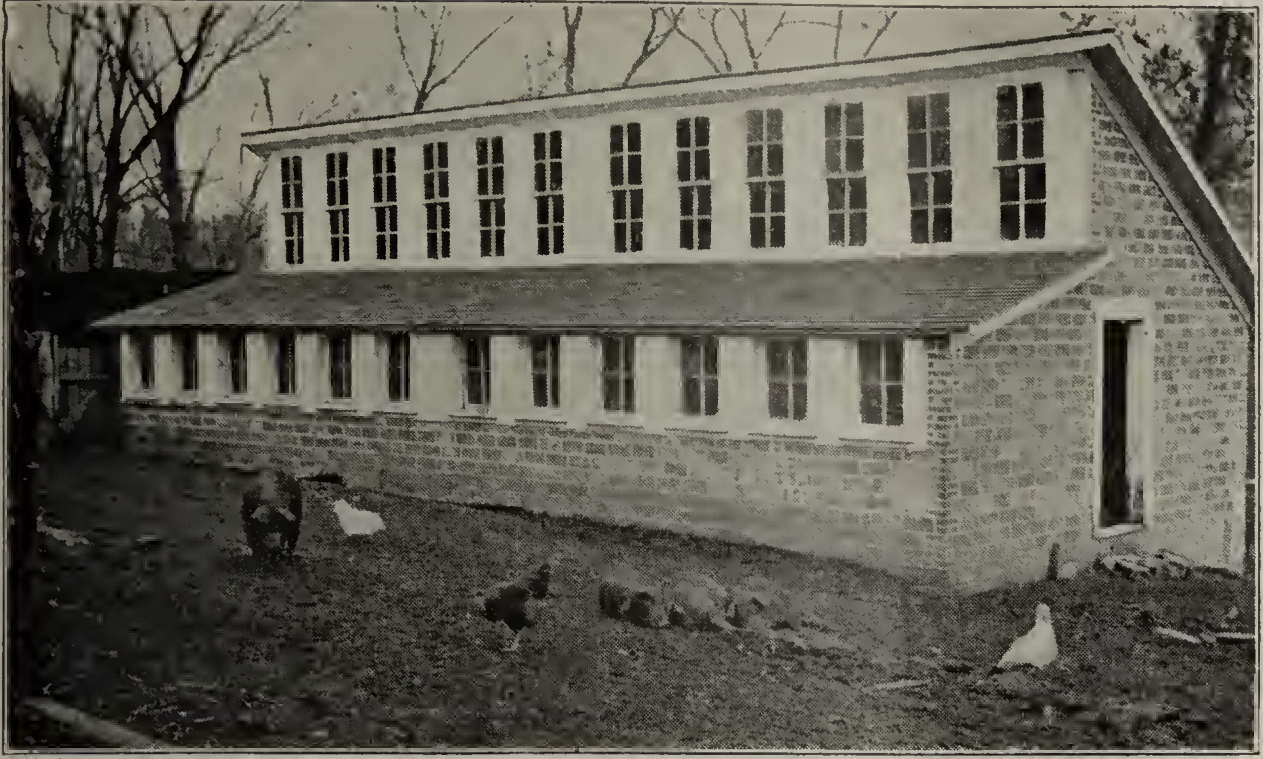
—SOUTH ELEVATION—



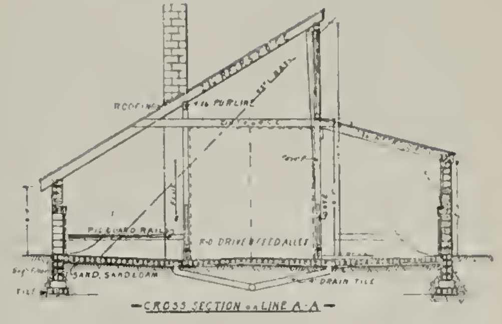
— ECONOMY DRAIN SYSTEM —
Scale ½"=1'0"



—WEST ELEVATION—



The Semi-Monitor Hog House.



ered. This gives you a choice between concrete and hollow clay blocks. We all know that concrete, if well made and properly laid, is quite permanent. We also know that hollow clay blocks, selected for this purpose, are even more permanent. Floors made of these materials will in many cases cost approximately the same. Where gravel or stone are difficult to obtain or expensive, or at times when the price of cement is up, clay block floors will be found cheaper than concrete.

The hog house floor is naturally the bed of the pigs. Theoretically, the clay block floor should make a better bed than any other kind of floor. It carries less moisture up from the ground and takes less heat away from the hog, because of the large percentage of air space in the hollow block. The air space is especially effective when the heat is applied from above, as in the case of hogs lying flat on the blocks. So you see, theoretically, we have every reason to consider blocks better for hog house floors than any other material.

It remained for Professor Kaiser, of the Agricultural Engineering Department at Ames, co-operating with Professor Evvard, to determine from an entirely practical standpoint what kind of floor is best. As before stated, these men have done a great deal for the Iowa hog, enabling him to lead a shorter and more profitable life. With their high respect for the hog's knowledge of himself, they furnished a bunch of ordinary hogs an opportunity to choose between concrete and clay block floors. It did not require a second trial for the hogs to show their preference. They all chose the hollow block floor, and were even willing to fight for a chance to sleep on it.

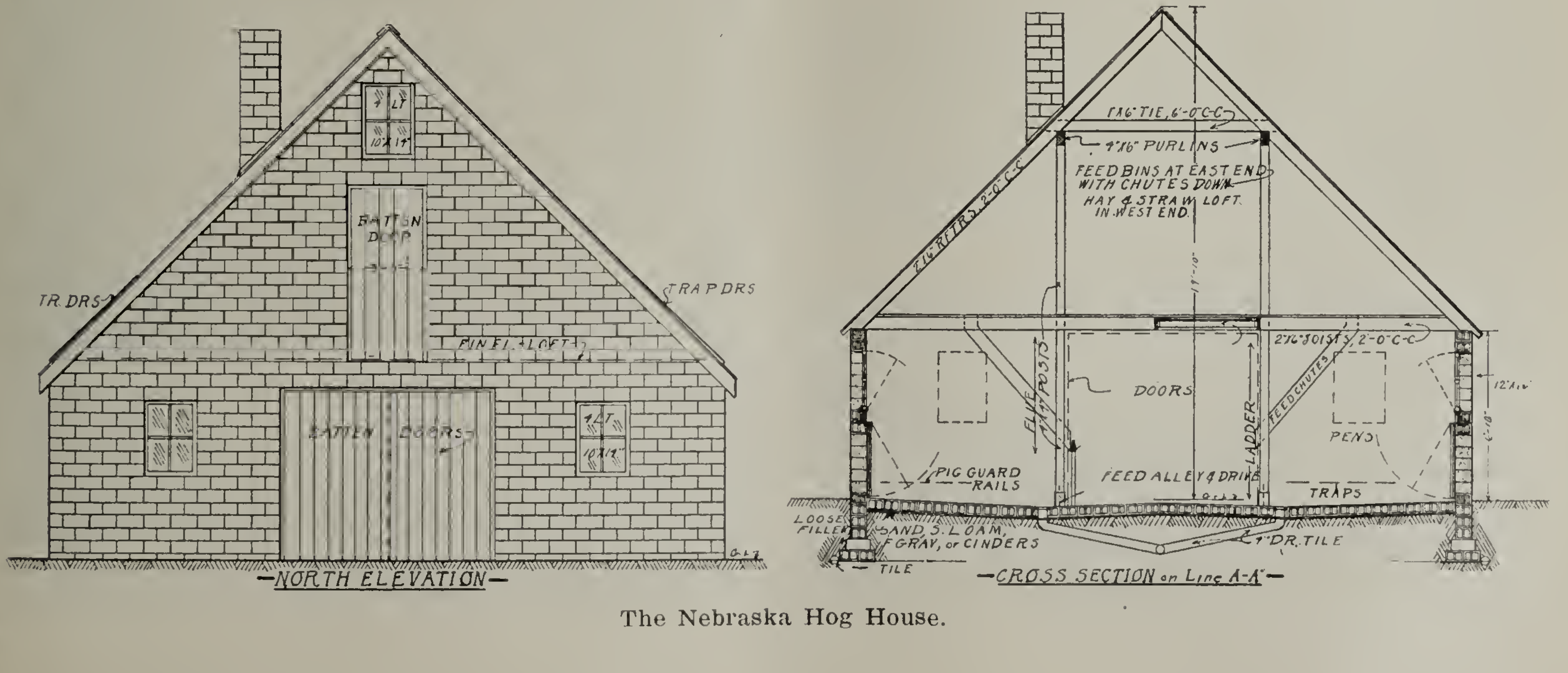
You see our theory of dryness and air space was good theory, because the hog's practical knowledge of how the floor felt to him agreed with the theory. Therefore, whether you follow theory or practice in your hog house, you will use hollow block floors in every case.

How Do You Figure What Your Buildings Cost?

Do you figure first or last cost, or do you figure what your buildings cost per year? The latter is the right way. You should add the first cost, divided by the length of time the building will last, to the annual cost of paint, repairs, taxes and insurance. This will give the actual cost per year.

Of course, you know there are some things insurance cannot cover, even though you collect enough from the insurance company to replace the buildings—the inconvenience of rebuilding, upsetting your plans for the season, and "getting along" until the new buildings are ready. *A fire is always a loss to you.*

Break away from the habit of building as your father was



The Nebraska Hog House.

forced to build. In his day wood was cheap and clay blocks had not come into general use. This condition made burnable material excusable. My father drove a yoke of oxen and built his barns of wood. He used the best he could get. Farming has progressed; you should use the best you can get, building with permanent materials.

Look over the wood hog houses of your neighborhood. If you build of burnable material, you should figure annually a cost of at least 10 per cent. to cover depreciation and repairs. If you build of hard burned clay, this annual cost will not be more than 2 per cent. of your original investment.

The original cost of a permanent clay building is no more than a burnable structure, and the upkeep is much less. Even if the total cost of the permanent building were more, you could borrow the money, and by paying to the bank what you would otherwise have to pay for paint and repairs, return the loan with interest in a short time.

The subsequent saving on repairs and maintenance, coupled with the fact that your permanent building lasts many years longer, will prove to you and your children that your judgment was good.

Importance of a Good Hog House and Early Pigs for Profit.

Every one realizes the advantage of marketing his hogs ahead of the bulk of hogs in the country. It is simply another case of "Get there early and avoid the rush."

The only way to save the pigs and to get them on the market early is to arrange for early farrowing in a good, warm, roomy hog house. If there is room to exercise in a light, warm, ventilated house, there is no reason why a pig should not do as well in March as in May. *Get your hogs on the market thirty days earlier and pay for your hog house out of the profits.*

The clay block hog houses shown herewith offer all the above advantages. They are well lighted and ventilated. A clay block building is warm in winter and cool in summer. You know that the dead-air spaces in the walls hold in the house heat given off by the pig's body. In the same way these air spaces prevent the heat of summer from passing through the wall into the house. It is a poor rule that doesn't work both ways.

Remember this: Moisture cannot get through a dense material like hard burned clay, neither can it get through horizontal dead-air spaces.

Hollow clay blocks make an excellent hog house when built according to these plans, because heat cannot pass through the walls. The ventilation is good. It can be controlled and will not cause drafts.

The plans provide a roomy building that will accommodate a big bunch of early pigs. The owner will have a permanent building, one that will last for generations and pay well every year. There will be little or no expense for painting or repairs. What more could be said for any building or building material. The extra profits from early farrowing will pay for the hog house in a short time, after which you can put the profit in your own pocket.

The Iowa Hog House.

The Iowa type is named, like the Iowa silo, because it was originated and developed by the men of the experiment station at Iowa State College, Ames.

The Iowa is an economical form of hog house. It is neat, compact, solid, permanent, warm. A glance will show that, with the large portion of the roof at the peak devoted entirely to glass, this type is better lighted than any other.

It is designed to extend north and south, so that from sunrise to sunset the warm rays of the sun are shining in the hog house, through the full width of the double row of windows.

Of course, there are times in the summer when the direct rays of the sun shining through the roof will not be desirable, and there are cold days in the winter when the sun does not shine, but this type of hog house, on the whole, is exceptionally satisfactory and owners are enthusiastic.

The Semi-Monitor Hog House.

This type of hog house is abundantly lighted. It is an older design and is used more widely than any other type shown. It should invariably extend east and west, with the windows to the south.

Some criticise this type on account of its being higher than the other one-story hog houses, thus increasing the cost and decreasing its warmth, but it is probably slightly cooler in summer.

It is very hard to secure every desirable feature in one type of house, which is the main reason why we are presenting all the most approved designs for the consideration of the practical farmer. Each man should decide for himself, taking into consideration the location of the building and similar important matters.

The Nebraska Hog House.

Prof. L. W. Chase, of Lincoln, was among the first to analyze the question of light and the location of windows in hog houses. He is a very practical student of the construction and arrangement of farm buildings, and after considering all types, it is his opinion that the two-story Nebraska hog house offers more advantages than any other.

This hog house has been used widely in Nebraska, Iowa and other states of the Middle West. It is not so abundantly supplied with light and sunshine as the other types shown, but Professor Chase and several veterinarians of experience have found there is enough light to combat tuberculosis and maintain sanitary conditions.

The store room above materially reduces the radiation of heat through the roof, making the building warmer when the sun would not furnish heat through the roof windows. Little extra wall is required and considerable storage space is secured at small expense, placing hay, grain and bedding conveniently at hand.

LAVISH WASTE.

The United States Bureau of Mines tells in its annual report of the needless waste of natural gas in drilling oil wells which has not wholly ceased, but which, let us hope, is coming to an end. It has been the habit of oil drillers, when they struck high pressure gas, to let it escape into the air until the pressure was sufficiently reduced to enable them to begin to drill again. In the Oklahoma district the total combined waste of four wells alone was over 5,000,000,000 cubic feet of gas which equals over 250,000 tons of coal or enough to supply the needs of 50,000 families for one year. In 1913 in the same Oklahoma field there was a waste of over 100,000,000,000 cubic feet which equals 5,500,000 tons of coal or enough to supply the wants of 1,000,000 families for one year. This was wasted to produce about 30,000 barrels of oil daily. Or, as the report reads, $75,000 worth of gas was wasted to produce oil worth $25,000 every twenty-four hours. The bureau sent out engineers to teach proper drilling methods, and in a few weeks they proved that not a single cubic foot of gas need be lost. The improved method not only keeps it under ground where it is still available, but it reduces the time for drilling for oil. It is called the "mud-laden fluid system" and is fully described in Bulletin 134 of the Bureau of Mines.

Of course, the million families that would like to have gas piped to them to use in the place of coal, can't have it. It is gone forever. But of that which remains in the ground, some day, somebody will be able to use it. We are all one big family of citizens in this country and waste of this sort seems like robbing the great American cradle.

Written for THE CLAY-WORKER.

BUTTON-HOLE TALKS.

FINGER PRINTS OF LONG AGO.

IN THE MUSEUM, housed in the old Governor's Palace, in Santa Fe, N. M., there is placed a glass case which had, to me, more than casual interest. It had, indeed, surpassing interest to the extent that I returned to it again and again. It contained pottery, but there were many other cases containing pottery, and that, too, of larger and more imposing forms. In this particular case there were but few pieces, a half dozen or so, and these of small size and of rather indifferent workmanship, but they seemed to hold more of interest to me than all the others combined.

W. D. Gates.

They were discovered by the ethnologists, busy in their excavations, trying to find what they could that would show what manner of men there were here in the prehistoric times and what manner of life they lived. In this particular instance they came, in their digging, to some bones. Proceeding very carefully, so as to not disturb them, so they might note every possible item of condition and placement, they uncovered the skeleton of a little child, and with it, and about it, the little collection of pottery that now occupies this glass case.

On close examination it was found that these vases were the work of very childish hands, without doubt of the very hands of this little child whose skeleton hands were now unearthed. The execution was childish, the workmanship crude and unfinished, the shaping uneven, but, on close inspection, it was clearly evident that they bore her signature in the form of the clearly impressed imprint of her childish finger, impressed in the clay matrix, and then made there permanent by the firing of the vase.

Just as the little girls of today watch their mothers in their cake and pie-making and imitate them with their little play cakes and pies, so this little maiden of the long ago had watched her mother busy with her pottery, and with her own little fingers had made the toy pottery that had laid buried, countless generations, to at last fill this case and tell its story of the past. These had remained to tell us, ages later, that childhood is always the same—earnest, active, playful, trustful and truthful, then as now. Left to us to tell us many things, to call to our attention also the fact that it is not always, or necessarily, the greatest of us that leaves the most lasting impression, but often, as in the case of this little child, the smallest, the most obscure, that leaves the lasting mark of having lived their lives on this world of ours. Of the big chieftains of her time, of the great warriors, of her big medicine men, none of them has left anything to now show for the lives they lived or the work they did. Even so of countless great men who in their time were held great in the generations that have passed in the great review since this little one formed these handfuls of clay and shaped them into lasting form, they have lived their brief day and passed on, leaving nothing to show that they had lived or wrought. All that they thought so important, so imposing, of such great moment, left no impress for the future—was like the writing on the sand of momentary imprint, while this playful act of a little child is preserved for all time. We can never judge as to what acts of ours will be remembered and what forgotten. The very things we considered big and important may be passed as trivial, while the little obscure acts may stand out in emphasis. We have a tendency to magnify our cares and cuddle our joys too little. Thirty-day paper is a nightmare for a month, but, if properly treated, thereafter becomes waste paper and is forgotten. Note, however, lest I be misunderstood, I say **properly treated**, for if not so treated nothing can be more agonizing than such paper on the thirtieth and succeeding days. Anyway, most of us leave little or nothing to show when we go, and it's better to leave nothing than something hurtful. The playful act of the child is much better than the world devastating act of a king. GATES.

THE "IMPERVITE" PROTECTING TUBES FOR PYROMETERS.

AS ANOTHER INSTANCE of the ability of American manufacturers to produce goods which before the war was believed to be impossible, and to compete in quality and price with certain foreign-made goods, the manufacture of "Impervite" porcelain ware by Charles Engelhard, 30 Church street, New York, N. Y., is an example.

It is a true saying that "necessity is the mother of invention." This firm, which makes a specialty of high temperature pyrometers, previously used "Marquardt Mass" protecting tubes for its thermo-couples almost exclusively. When these were cut off, it found that other porcelain protecting tubes available did not afford a perfect protection to the thermo-couples, as a result of which the platinum wires from which the thermo-couples were made did not give the service that they formerly gave when protected with Marquardt tubes.

By securing the co-operation of some of the foremost ceramic experts in the country, and after about eight months of experimentation, they have been able to produce a tube which will be known as "Impervite," for which the following claims in comparison with the Marquardt tubes, previously imported, are made:

1. The body of the two tubes, i. e., Impervite and Marquardt, is practically identical, having almost exactly the same coefficient of expansion, the same mechanical strength, the same porosity, and both absolutely without effect upon platinum wire under high temperatures. The fusing point of the body has not been accurately determined, but is above 3,500 deg. Fahr.

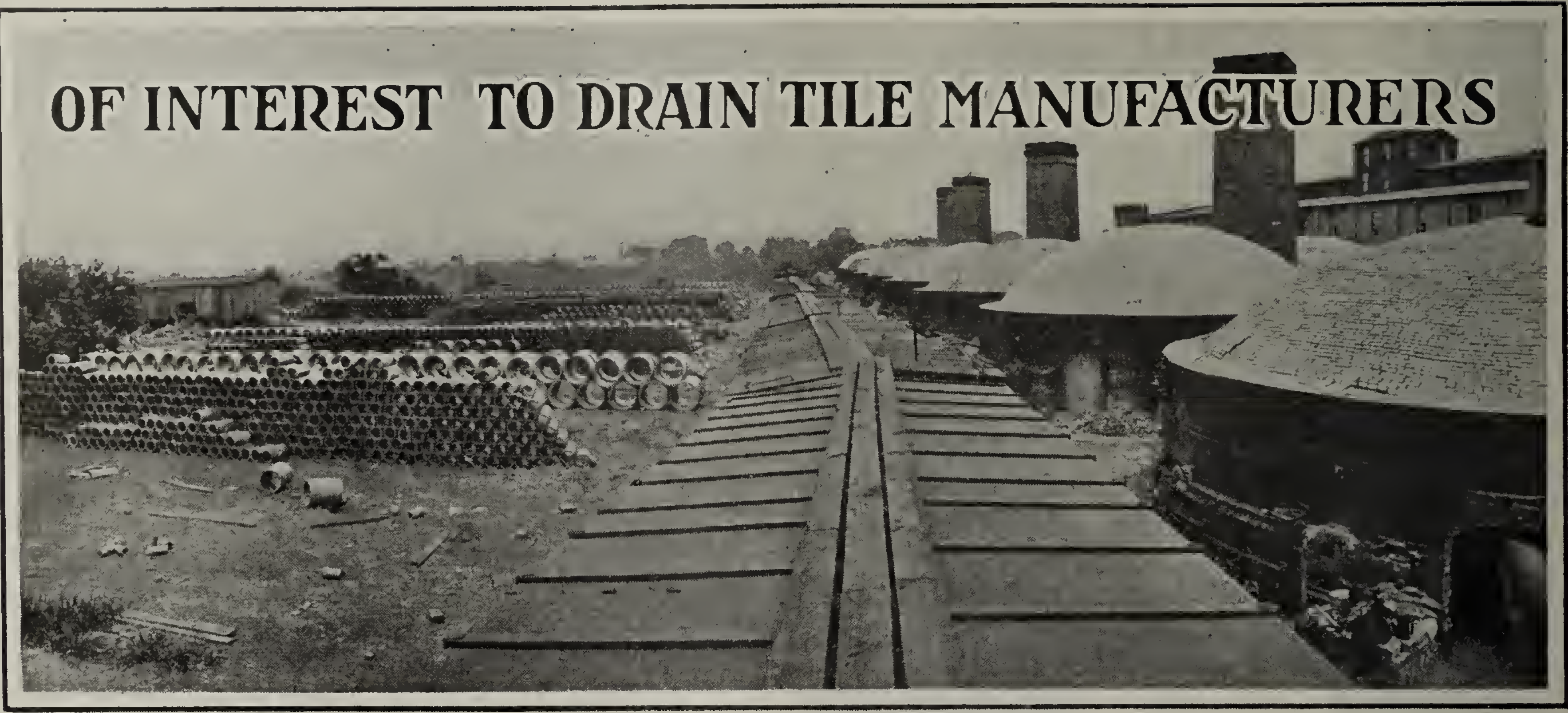
2. The glaze of the "Impervite" tube is of a different nature than Marquardt, being harder after it is matured, and having a softening point more than 100 deg. C. above the softening point of the Marquardt glaze. This glaze is thoroughly impervious when uniformly applied, and strongly resistant to fluxing action. It possesses a further decided advantage, in that it does not become as sticky at high temperatures above its softening point as does the Marquardt glaze, as a result of which it does not so readily adhere to an outside protecting tube when heated above the softening point, and then allowed to cool below the softening point.

The body and glaze, as used in "Impervite" tubes, lend themselves to other porcelain ware, and it is understood that the facilities of the firm making the "Impervite" tubes permit the manufacture of a variety of other similar ware.

The layman who has use for pyrometers, but frequently does not thoroughly understand them, does not appreciate the very great importance of using only the very highest grade of protecting tubes over his thermo-couples. Not only the accuracy, but the life of the thermo-couples, very much depends upon the ability of the protecting tubes to exclude all gases, and to stand up both physically and mechanically under the furnace conditions in which they are installed.

It is now becoming common practice not only to protect thermo-couples of the platinum-rhodium and platinum-iridium group with this type of tube, but also the thermo-couples known as "base metal" thermo-couples, it having been found that the accuracy and life of base metal thermo-couples, when so protected, are very materially improved.

OF INTEREST TO DRAIN TILE MANUFACTURERS



THE FACTORS OF DEPRECIATION AND THEIR IMPORTANCE IN FIGURING COST.

THERE is no branch of the clayworking industry that is doing more to bring ultimate victory to the United States in the present war than that of the drain tile interests.

In this time of the great importance of increased crops, drain tile is doing a most important work. Mother nature has smiled and cried upon our agricultural lands, (God has surely been on our side in the preparation period) and the result has been enormous yields. Man has had to do his full share however in the preparation and tilling of his soils and those farmers who were fortunate in having their farms tiled found their tasks less difficult and their crops maturing at a much earlier period than those who cultivated untiled soils. The big crop yields were on the tiled farms, the usual difference being 60 to 100 bushels of corn on the tiled to 20 to 60 on the untiled. The wheat crop varied 20 to 53 in comparison to 10 to 20 bushels per acre. Other crops bore similar ratios.

Every progressive farmer realizes the importance of drain tile in ridding the soil of its surplus water, relieving it of its dense structure, securing room in the soil for the circulation of air and the admission of the fertilizing elements, etc. These farmers give great deserved credit to the drain tile manufacturers of the country for their splendid work in producing clay drain tile so essential and valuable in increasing the crop yields.

The drain tile manufacturers should be proud of their efforts and thankful that they have established themselves in a line so important to the entire world at this time.

Thousands of drain tile manufacturers are busily engaged using every ounce of steam and all the man power possible to supply the great demands upon them. There is scarcely a drain tile plant in this country in the crop producing sections which has not found it most difficult to get a little stock on hand for future orders. Many plants are entirely sold out and have booked orders several months in advance of the possible manufacture.

The drain tile manufacturers are having their troubles solving the coal, labor and car shortage problems the same as the brick and other clay product manufacturers but the conditions are not serious.

The outlook for an early solution of these particular troubles is bright and the tile manufacturer is not pessimistic by any means though inclined a little bit to be doubtful at times. The demand is so good and they are kept so busy turning out thousands of feet of tile that they have little time to worry much about future conditions.

The prices on drain tile over the country are generally good but really not high enough when the increased cost and great value of the article are taken into consideration. No manufacturer can produce tile at the same cost the pioneers of thirty years ago did. While the methods are much improved and labor saving machinery of every description are now in use, hardly thought of in the olden days, the cost of every item entering into the business is so unreasonably greater now than then that even the labor saving machinery and better methods do not make up for the difference in this particular.

With this knowledge at hand, the drain tile manufacturer should be deeply interested in figuring his cost. To be satisfied that he is making tile better than his ancestors did and to simply estimate his cost by the receipts, bills paid and the balance he has in the bank is a mighty poor and usually bankrupting method of doing business.

His clay is worth something. Some day he must buy new clay land or at least his successors will and since it is poor policy and unjust to the future generations not to do so, a necessary figure should be made in the value of the clay, if the actual cost is to be known. Successful drain tile manufacturers who have made a careful study of cost items, place the cost of the raw material in the field alone at 2½ cents a ton.

The clay cost item is a small one taken into consideration with other factors of depreciation. A great many manufacturers are figuring in the following percentages for factors of depreciation to get the real cost of their product: 2½ to 3 per cent. on cost of buildings, 5 per cent. on cost of kilns and 10 per cent. on cost of machinery and tools. Naturally the buildings will last the longest and the machinery and the tools have the shortest lives. It has been figured that new equipment (or repairs to make up the difference) must be purchased amounting to total first cost at the end of ten years, thus making the factor of depreciation 10 per cent. The kilns last longer than the machinery and equipment. Twenty years has been figured as the average life, therefore 5 per cent. has been made the factor of depreciation of the kiln to be added to the cost of the product.

Does the average drain tile manufacturer figure in these factors in estimating his cost? The answer is—Decidedly no. The reason for this is unexplainable. We think every manufacturer should realize the need of this and put it into operation. How can he know his costs if he does not take these points into consideration? He can not possibly know his cost and is only safe in the selling end by quoting the figures asked by those manufacturers who know their cost.

The leading manufacturers state that the old prices would be ruinous to them for they have had to add to the original cost of their equipment, etc., for their factors because of the greatly increased cost of all materials and must make up also for the increased expense of coal, labor, general overhead, freight, etc.

The prices on drain tile in the states of Ohio, Indiana, Illinois, and Iowa vary considerably. The prices in Iowa are much higher than in the other three states while the prices in certain parts of Ohio are the lowest. The average prices today in Illinois and Indiana are 4-inch tile $22, 5-inch tile $30.80, 6-inch tile $38.50, 7-inch tile $55, 8-inch tile $71.50, 10-inch tile $99, and 12-inch tile $137. These are the minimum prices without discounts. Many manufacturers in Indiana and Illinois are quoting $24 and better for their 4-inch tile and proportionately more for the larger sizes.

The manufacturer who believes he can safely sell under these figures and by continuing thus leave a substantial business for his heirs, should not be satisfied with that conclusion but should investigate his cost accounting system and reach the correct solution by studying the business conditions, the expense and sales items and not be contented until he has figured in the cost all items entering into the manufacture including the factors of depreciation.

We urgently petition the drain tile manufacturers of the country to carefully consider these matters and to bring to our attention those problems which are of a perplexing nature to them, that we may render, if possible, assistance, a helping hand, in these particulars.

We have inaugurated this department to serve the drain tile interests of this country, Canada and other countries as well. We are going to publish in this department from time to time articles which will be deeply interesting and helpful to that branch of the ceramic industry.

Make it your personal obligation to your fellow manufacturer and the world in general to give the assistance you can render through this thought exchange in the Clay-Worker.

THE DRAIN TILE OUTLOOK.

No one, of course, can foretell, with any degree of certainty, what the future may bring forth, so it would be a foolish prophecy to say that more drain tile can be sold this winter and next spring than ever before. There is, however, some logic behind the idea that there is a better opportunity today to promote drain tile than ever before.

There are several reasons which make this better opportunity. One is the high price of farm products which furnish good returns and money to buy with, on the one hand, while on the other hand, they encourage a tendency to intensive farming to get the greatest possible production. Plainly, there are many farms which can be increased in their productiveness by tile drainage and the great demand for all kinds of farm products certainly should encourage the draining of land where it will improve the yield and the quality of the product.

Another thing making for larger opportunities is in the fact that farmers themselves are spreading out, in some instances taking on additional land which they expect to improve. In other instances, men with well developed farms have taken advantage of the situation to sell at high prices and are investing again in cheaper land which they expect to improve. So there is some shifting about and a tendency to improve and intensify cultivation on all sides. With this tendency present and with the big returns the farmers are getting for their product, it looks like a mighty good chance to boost the drain tile game.

During the fall and winter season the drain tile people should be able to develop better business, comparatively, than is to be found in any branch of the clayworking industry, aside from fire brick. The opportunities are there and it is simply a matter of making the most of them.

CLAY AND CLAY PRODUCTS AT THE CHEMICAL EXPOSITION.

ALL OF THE last week in September New York was the Mecca of chemists and manufacturers of chemicals. Three floors in the Grand Central Palace were filled with an exhibition of what American chemists and manufacturers of chemicals, chemical processes and machinery for making chemicals, have done within the past few years. Three years ago the exposition occupied not quite all of one floor. Last year it filled one and nearly a second. This year it was crowded into three. Next year, at the same rate of increase, it will take more than four.

To undertake to enumerate the chemicals exhibited would be out of the question. The list is too long, and, besides, clay men are not especially interested in chemicals. But the development of this industry so rapidly and so well is worth while and makes a difference to them regardless of whether they are interested in chemicals or not. America is independent of European manufacturers, something which has never been true before in the history of the country. This exposition was concrete evidence of the solid establishment of this important industry in this country. Apparently no competition will be able to dislodge it from its present commanding position. The domination of any other country has disappeared forever. American manufacturers are now in absolute control of the commercial situation in their own business. About 375 firms exhibited, and their contributions occupied all the way from the entire end of the building, in the case of several different firms, to the small booths a few feet square, which met the requirements of others. But all were representative and all told their respective shares of a story of commercial development which reads almost like a romance.

Clayworkers should be interested in the incidental information about localities where inexhaustible quantities of raw clay are available and in the various manufactures of clay which were shown in connection with the chemicals and chemical apparatus. The displays were ample to attract much attention, and those in charge of the various exhibits in which raw clay, or manufactures of clay, formed a part, were asked a great many questions about that portion of their offerings. And very many went away with a different impression of the clay industry.

Suppose the exhibit made by the city of Knoxville, Tenn., be considered. Apart from the interesting information regarding transportation and fuel, to which might have been added labor, clay men would have been interested to see the clays and kaolins which were included in the city's exhibit. Ball clay and wad clay, both light and dark, were shown by the Mandle Clay Mining Company, of St. Louis. Kaolin, by Harris Clay Corporation, Dillsboro, N. C.; North Carolina china clay by the Southern Potteries Company, Erwin, Tenn. The same company showed Florida china clay, No. 1 Tennessee ball clay and No. 2 Tennessee ball clay. Sagger clay was exhibited by W. T. Harris, Jellico Junction, Tenn.; pottery, decorated tile and ball clays by the Mandle Clay Mining Company, of St. Louis. Peter Zechini, Newcomb, Tenn., had a display of pressed brick.

This was an ample exhibit for one locality. Some of the clay was of very fine quality, and a set of dishes, handsomely decorated, made from the kaolin found in that vicinity, led to the conclusion that it is no longer necessary to either seek the finished product abroad or import kaolin for its manufacture. The South appears to have an ample supply of desirable quality. Dishes unglazed showed perfectly even texture. Whether the clay can be worked down so that it will make the partially transparent pottery, which is so much prized, could not be determined from the samples of finished or partially finished product, but the articles shown were quite as good as the imported of the same grade.

A large collection of Coor's U. S. A. chemical and scientific porcelain was shown by the Herold China and Pottery Company, Golden, Colo., and the Denver Fire Clay Company had an exhibit of its products in the same booth. None of these are objects of beauty, but their excellence for the purpose intended could hardly be questioned.

Maurice Knight, of East Akron, Ohio, was there with a selection of his acid-proof chemical stoneware. In explaining his product, Mr. Knight said that he doesn't depend upon the glaze to make his product acid proof. He said he is equipped to furnish one piece or establish a whole plant, as desired. "My ware is not the cheapest," he said, "but it is right, and we guarantee it. We use different clay and methods of manufacture from anybody in our district; therefore, our ware is distinctive, and we see that it satisfies." He makes acid-proof brick, special ware and pipe.

The B. Mifflin Hood Brick Company, Atlanta, Ga., had a large collection of its acid-proof blocks and rings. In addition was an exhibit of its chemical brick, chemical tile and its acid-proof cement with which the brick and tile are laid. Chemical manufacturers know the values of these products in their daily operations.

The Quigley Specialties Company was showing its "Hytempite," a fire brick bond which withstands any degree of heat, as shown in the repair of crucibles which cracked under the intense heat, were mended and afterward used repeatedly.

C. H. Zeiger, of Brooklyn, N. Y., represented the Miner-Edgar Company, who handle clays for paper filler and other purposes where extraordinary fine quality is wanted. The specimens shown were as fine and soft and gritless as it is possible for earth to be. The clays handled by this firm all come from along the line of the Georgia Central railroad.

The General Chemical Ceramics Company, of New York, displayed ceramics for use in chemical manufacture, acid containers, various sorts of acid-proof condensers and other manufactures of a similar character.

The Guernsey Earthenware Company, Cambridge, Ohio, was present with a large collection of its laboratory porcelain, and handed an indorsement of its quality written by Thomas A. Edison to all visitors.

The Southern Railway system had a large exhibit, and among its other features emphasized pottery and paper clays which are found in immense deposits along its route in South Carolina and Alabama. Some of the specimens should interest those who need such clays in their manufacturing enterprises. Besides these, it had examples of large deposits of kaolin and refractories materials. All were of the best quality for the purpose.

The state of Louisiana displayed its chemical and mineral resources, and among them were good examples of clay. One specimen called Sharkey clay, a dark gray, and very fine to the touch, indicated something of its value for various purposes. The deposit from which it was taken was said to be practically endless and not far from transportation, provided it was to be mined, or near a suitable location for a factory to make it up there if preferred.

Texas was present with a collection of its chemical and mineral resources that might have astonished Northern people who never knew anything definite about them. Those who have looked upon Texas as a wild state composed principally of sage brush and plains will have a different impression after seeing the wonderful mineral resources epitomized in that display.

Among the rest were some very good clays. F. E. Pye, chairman of the Texas committee, was ready to explain what one wished to know. He said of the clays that the deposits are practically inexhaustible and are well located for working. He said that the composition of the clays runs about like this:

Lime, 3.63 per cent.; magnesia, 0.94 per cent.; soda, 0.82 per cent.; potash, 0.86 per cent.; titanic acid, 0.97 per cent.; tensile strength, fire clays, 115.1 pounds per square inch; stoneware clays, 177.6 pounds per square inch; calcareous clays, 262.4 pounds per square inch; loamy brick clays, 15.2 pounds per square inch. These figures are averages in all instances and are intended to give a reasonably accurate knowledge of the composition of Texas clays. The opportunity for the manufacture of fire brick, decorative brick and tile is unlimited and capable of indefinite expansion. Moreover, the present arrangement of railroad rates in the state gives a practical monopoly of such shipments in local zones.

To go back for a moment to Knoxville it seems that the supply of clay in East Tennessee includes shales and clays suitable for the manufacture of common brick, paving brick, drain tile, sewer pipe, pottery and fire clays. Here is what was said respecting these clays:

"Fire clays are found at a number of horizons in the coal-bearing rocks of the Cumberland plateau in East Tennessee. Many of these are under-clays associated with coal seams, though in other cases clays or shales that are highly resistant are found outside of direct association with coal seams, but imbedded in other rocks of the coal-bearing series. At one horizon is a flint clay. Very few tests of the fire clays of the state have been made and very few developments have followed. Plants for the manufacture of brick are in operation in Robbins and Oliver Springs, but abundant opportunity exists for further development along any of the lines of railroad that traverse the localities where the deposits are found."

It seems that since the war in Europe imports of certain varieties of clays have fallen off, and the clays found in the South have been utilized as never before in supplying the deficiency. Much of the clay now mined in these localities is used in American potteries which have always heretofore imported their raw product.

The Carolina, Clinchfield & Ohio railway had a large exhibit of the chemical products of the region through which it runs. Among them was a high grade of kaolin. It was said of these deposits that they are found along the Clinchfield route in sufficient numbers to be of great value, and those which have been commercially operated have proved the quality of the material. The clay is excellent for the production of tableware, decorative tile and similar products. The deposits are located principally in Yancey and Mitchell Counties, North Carolina, and are associated with the Roan and Carolina gneiss. A large kaolin plant is now located on the line of the railroad and the only pottery in the South is near.

While West Virginia had no separate exhibit, information concerning the state was distributed by the Southern Railway. One of the interesting features of this information was the statement concerning the construction of new roads in different counties. These, it was said, are made largely of brick in many localities and of clay, mixed with sand, in others. It would appear that West Virginia is a firm believer in the use of clay, burned or otherwise, in the construction of its roads.

While most of these exhibits were outside of the realm of brickmaking, they served to draw attention to the fact that brickmaking is becoming merely one of the important developments of the clay industry. Unquestionably these deposits of excellent kaolin will shortly come to be sources of raw material of great value to manufacturers of different grades of tableware and porcelains. If the import of kaolins needed for this type of manufacture can be stopped and the clays found at home can be used instead the results will be beneficial. Development of home resources is advisable. If ever any more trouble breaks out in Europe the same difficulties will not confront manufacturers of various products, the raw material for which was brought from abroad, that disturbed numerous industries this time. Pottery was only one, but with the inexhaustible supplies of kaolin suitable for pottery manufacture on American soil it seems useless to depend upon foreign producers for it.

Unquestionably the chemical exposition has opened the eyes of many Americans to the opportunities for development of this character which can be found at home. The specimens of manufactures from this raw material rivaled what has hitherto come from abroad. It remains now for capitalists to undertake their development upon a scale large enough to supply home requirements.

The American Ceramic Society was an exhibitor, and a feature of the program on Friday afternoon was a meeting of the society, at which M. Malinovsky, an authority on the subject, delivered an address on "Refractory and Stoneware of Malinite."

He began by referring to the fact that a great many industries were seriously inconvenienced by the war in Europe, which cut off the supplies of certain products that hitherto were obtained there. But he congratulated Americans upon the characteristic energy and resource with which they met the problems thus presented and succeeding in overcoming the handicaps produced by the shortage that arose from the war. Continuing, he said:

"In the field of ceramics, and more especially refractories, the Malinite Company has been making its contribution to processes during the years of strife. It has carried on extensive research work, having for its purpose the development of processes by which certain waste mineral resources could be employed for making ceramic products possessing properties at least comparable, if not superior, to those which formerly were produced in Europe.

"The work has been eminently successful, and as a result many articles necessary to different industries have been made in the laboratories from materials sent to the company from widely separated states. The laboratory operations are now to be supplanted by commercial production, and within a very short time the company will begin marketing a high grade of refractory ware made from materials which were previously considered waste.

"Refractory ware, in the commercial sense, is a material which will stand the high temperature of furnaces. Such a ware may be fireproof in one furnace under one set of conditions, whereas it will not nearly meet the requirements in another furnace under different conditions. It has been our aim to produce something as nearly general in its usefulness as we could, and we have produced what we believe is a ware that will bring the best results in all furnaces. It has taken time, careful research and the expenditure of much money, but I am convinced that we have contributed to ceramic progress to the extent that we are now in position to offer users of such wares something which has successfully withstood every test to which it has been subjected and will surpass for the purpose intended any similar product hitherto procurable.

"More and more exacting grow the requirements, but in our research work we have sought to meet the needs, and our tests lead us to think we have achieved a success and have added to the development of ceramics a very important and useful contribution."

THE CERAMIST'S CORNER

This is a department which appears in The Clay-Worker from time to time dealing with practical and technical matters of especial interest to the ceramist. This month we publish a paper by H. Ries which the author read at the meeting of the American Ceramic Society in New York, the last week in September.

EFFECT OF THE WAR ON THE DEVELOPMENT OF THE CLAYS OF THE UNITED STATES.

By Heinrich Ries, Ithaca, N. Y.

IT IS PROBABLE that few people realize the dependence of different countries on each other for their supplies of mineral products, and hence that many of them are able to depend solely on domestic production. The United States is perhaps among the most fortunate in this respect, but while it leads the world in the production of some mineral products, such as coal, iron, oil, zinc, copper, etc., it nevertheless has imported from foreign countries a considerable portion of its supply of both metallic and non-metallic products, including such materials as tin, manganese and chromium among the metals, and graphite, barite, asbestos and clay among the non-metals.

This condition naturally brings up the question whether this country is completely lacking in these supplies, or whether the large importation is due to some other causes.

As I see it, there may be several reasons for our high imports of certain materials, the following being some of them: 1. Absence or insufficiency of the desired material in the United States. 2. Cheaper product obtainable from abroad, due to the fact that the domestic product, because of location, labor conditions or geologic associations, cannot be as economically obtained in marketable purity. 3. Greater care in mining and preparing the foreign material for market. 4. Inferiority of domestic product as mined.

There is no doubt that both the second and third factors have been instrumental in aiding the importance of foreign mineral products.

Coming now more particularly to the raw materials used in the ceramic industry, we find, as well known to many, that this country has been dependent on foreign countries to a very large extent for much of the clay used in domestic ceramic industries. Indeed, we have even imported the finished wares in such quantities as should make us feel a keen sense of mortification, and we ask ourselves whether this strong market for foreign wares is due to a craze for European china on the part of the purchasing public, or inability to produce it here, or impossibility to compete with foreign prices if the same wares were produced here. No doubt all three causes have been in part operative.

Among the clays imported from Europe we have kaolin or china clay, ball clay, fire clay, glass-pot clay, crucible clay, etc. Kaolin or china clay is obtained mainly from England, and the supply of this has not been completely shut off by the war; nevertheless, manufacturers have given more consideration to possible domestic sources. There are in the Eastern States and in North Carolina extensive deposits of kaolin, which, though derived from rock similar to the well-known Cornwall clay, are not identical with it. The individual deposits, moreover, show variation in shrinkage, which may be due in part to the character of the parent rock from which these kaolins have been derived. Similar kaolins have been found in Georgia, Virginia, Pennsylvania, Maryland and Delaware, but while the deposits are all formed by the weathering of pegmatite veins, the relative amounts of clay, quartz and mica vary greatly in the different clay deposits, and hence the quantity of washed product obtainable is not the same in all cases. I believe that the quantity of clay obtainable from this belt could be greatly increased not only by developing more of the known deposits, but also by more careful washing, thus eliminating the loss of a good deal of the very finest clay.

But while these residual kaolins are not regarded as a good substitute for English china clay, we have another source of white clay that can be drawn upon and whose development has no doubt been stimulated by war conditions. I refer to the white sedimentary clays found in the coastal plain area of Georgia and South Carolina, and developed especially in the former State.

It has been found that by proper treatment these clays can be so improved as to color, burning qualities and shrinkage, as to serve as a substitute for the best English clay for many pottery purposes.

Moreover, it has been found from actual tests that in making vitreous china ware this purified Georgia clay can be satisfactorily substituted for all the ball clay hitherto used and at least 50 per cent of the English china clay.

There is, however, still another class of white clays that burn nearly white, but which lie untouched, viz., the deposits of residual clay on the west slopes of the Blue Ridge in Virginia. These are well located for development, and could probably be used as ingredients of at least sanitary ware and electrical porcelain.

Ball clays, formerly obtained almost entirely from abroad, are now obtainable in the United States, of a quality fully equal to, if not better than, those usually imported.

One of the greatest problems, however, has been to find a substitute for the glass-pot clays and those used in the manufacture of graphite crucibles and pencils. These peculiar refractory clays, of very dense burning character, have for a long time been mined in Germany and Belgium in case of the former, and in Germany in the case of the latter.

We have in this country been developing at least partial substitutes for the German pot clays, those from St. Louis being among the best known. Recently the Illinois Geological Survey has called attention to a deposit of clay found in one of the counties of that state that has all the qualities of glass-pot clays. Others have been found in Alabama that appear to be of promising character, and even other states have reported them.

There is, however, another phase of the question of domestic substitutes that it seems to me deserves more consideration.

It is desirable, if possible, to find substitutes that are as nearly alike in their physical properties to the imported materials as possible, partly for the reason that to replace them with others that are not exactly the same physically may involve a recasting of the mixture used, a process that many a manufacturer, for one or another reason, dislikes to do.

However, if it is possible that by proper blending we can use native clays in place of foreign ones, this is what I believe will be done.

Two other points to be considered are the geologic structure of the deposit and preparation for market.

Clay deposits are usually of sedimentary origin, and hence show the variations and alternations so characteristic of this type of deposit. This is a fact that should be borne in mind in planning for their development and mining, for neglect to do so has often led to wasteful mining and loss of much good material. The desire sometimes to get out one grade of clay, to the exclusion and neglect of all others in the deposit, has been the cause of much loss. There is no more eloquent example of this than some of the old dumps in the New Jersey fire clay region, where, in order to get at the better stoneware and fire clays in the early days of clay mining, other types were thrown on the dump in a hopeless mess.

Many of our younger sedimentary clays occur in the form of lenses, surrounded by less pure materials, calling for careful mining to prevent contamination of the marketable product. It is my opinion that greater care could and should be used in mining some of our native clays, although selective mining, especially where deposits are small, would be more expensive. This is a problem which we shall continually meet in the coastal plain area of our South Atlantic and Gulf States, from which many of our better sedimentary clays are now being obtained. And because of the peculiar geologic structure of the deposits a proper knowledge of geology is important in order to accurately determine their tonnage and general nature. Lack of this has often led to somewhat wild and costly deductions.

I believe that the situation is a promising one and that the war has opened our eyes to the ceramic possibilities of the country, whose recognition might otherwise have been long deferred.

Written for THE CLAY-WORKER.

CINCINNATI BRICK AND BUILDING SITUATION.

GENERAL BUILDING operations here have been somewhat curtailed on account of the war. There might be other reasons, too, but even these are attributable to the war and its direct effects in the matter of construction work. There are some projects contemplated which will be much help, but there does not appear to be any great rush to begin work, as the material, labor and kindred essentials are not at this time calculated to make the owners very eager to undertake work hastily.

There is not much activity among the brick manufacturers, the plants for the most part being closed down, as the season is growing late, and, with only a nominal demand, there is not any incentive to hustle at this time. The dealers are endeavoring to make the most of the situation, and are not overlooking anything, though it would appear that much of their labor is not of the profitable kind. There are some bids and materials being obtained on out-of-town work, and this has helped where the fortunate ones were able to obtain orders.

Several large structures are to be started here, and these will demand a considerable share of brick and other clay materials. One of these is the Dixie Terminal Building to be erected at Fourth and Walnut streets, and to extend for some distance toward Third street. A number of old buildings have been demolished to make place for this structure, and other work done preparatory to beginning actual work.

Reports here show that building operations for 1916 and 1917 show a decrease for September for the latter year. The total for the first eight months of 1917 shows an excess over last year for the same period, but the past month has shown a decrease. September, 1916, there were 1,260 permits issued, totaling $862,030, and for 1917 the same month only shows 886 permits, with a total of $798,915. The first eight months in 1916 were estimated at $8,249,475, and for 1917 they were $9,173,735.

Bankruptcy proceedings were instituted against the Dickman & Thompson Company, with offices in the Builders' Exchange, some days ago. This firm has been engaged in the real estate business and promoted the Bonnie Brae subdivision here. The liabilities were placed at $72,000 and the assets at $60,000. The trouble is given as due to the lack of business on account of the war.

A high school building is to be erected at Bethel, O., to cost $30,000. It will be 112 by 50 feet, two stories and basement. Ditloe, Fahnstock & Farber are the architects.

James Walsh will erect a ten-story building of brick and concrete at the southeast corner of Third and Vine streets. It will cost $175,000. It is to be a loft building.

The Knights of Pythias are collecting a fund for the erection of a Castle here. A nice sum has thus far been collected and subscribed for this structure.

One other large structure is to be erected here on Sixth street, near Vine, in the future. Some of the old buildings have been vacated, but as yet there has not been any definite action taken to remove these buildings. Therefore, it is not known how soon anything will be done toward the construction of the same.

The Board of Education has filed plans for the erection of a new school, to be known as the Hoffman School, on Durrell avenue, south of Hapsburg. It will be of brick, two stories high, to cost $200,000. The architecture will be Gothic, and the structure will be modern in all respects. It will be surmounted by a tower. Plans have been filed with the building commissioner. Plans for another school building, to be erected at Norwood, Ohio, have been prepared, but no definite action has been taken on this building as yet. It is reported that the allowance is under the amount that it would cost to build the school.

The opening of the Builders' and Traders' Exchange, some weeks ago, in new quarters in a spacious building at 614 Race street, gives this organization ample quarters, and plans are under way to make it a big feature in the building world. Several brick concerns have taken space here. While there will be no exhibit rooms, plans, conference rooms and other features make it an admirable place for the transaction of much business.

Business with the D. C. Shorey Brick Company has been very good, but this is due in part to the fact that this concern has not confined its efforts to local work. It has sought out-of-town contracts, and was fortunate in obtaining some nice jobs. Among these might be noted the contract for 100,000 of their "Shore-Tex" Old English pebble face brick for Mr. Harry Leyman's residence in this city. This is one of the finest residences to be erected here this year. It will be of English architecture. The face brick to be used on this building is an entirely new type here, representing brick that were made by hand in the sixteenth century.

This company has the contract to furnish a million smooth red "Shore-Tex" face brick for the new six-million-dollar power plant to be erected by the Union Gas and Electric Company, face brick of the "Shore-Tex" pattern for the garage and show house at Morrow, Ohio, and three-quarters of a million brick for the Owens Bottle Machinery plant No. 6, at Charleston, W. Va.

It is reported that the Cincinnati Brick Company is closing out its business, selling the equipment at its plant at Addyton, Ohio. It seems that there has not been very much done here of late, and the plant will become brick history. It is one of the old brick plants in this section.

Mr. Wilde, of the Cincinnati Clay Products Company, says that the present is not calculated to boost the brick and clay industry. This company is selling some architectural terra cotta, but in the brick line there has been little of interest in the past month or so. The outlook for the fall is not very promising for the brick industry.

Reports at the office of the Purcell-Grand Company were to the effect that the demand for face brick at the present time was only fair, there being nothing of a special nature to report, as business has been lacking life.

The J. M. Blair Brick Company has moved its offices from 34 West Sixth street to the Builders' and Traders' Exchange building. Mr. Blair said that the company's plant was closed down and would remain so until next spring. While there were some brick on hand, it was hard to take orders on account of the delivery question. This company ships by river, and some time ago lost a barge containing a large number of brick. The barge was damaged by a leak, and while some of the brick were saved, the loss was large. Since that time it has not been possible to obtain another barge.

The Brick Sales Company say that there is very little activity in the brick and clay industry now. The general building inactivity has hurt the business and the present indications are not of the promising kind.

Business in the face brick and kindred lines at the Moore-Cooney Company, as reported by Mr. Jackson, was slow. The war had stopped many building projects and orders were not plentiful on this account. This company has a very attractive display room, showing a number of very pretty patterns.

The offices of the Cincinnati Clay Company have been moved from 1431 to 1514 Union Trust building, and business is only fair. This company handles sewer pipe and various other clay lines.

The Ripley Brick Company has moved its offices from 808 Provident Bank building to the Builders' and Traders' Exchange.

At the office of the Builders' Material Company the report was that the brick demands were slow, as the general building situation at this time was not at all promising. CINCY.

PLANT MANAGEMENT

By Richard B. Hoehne.

Part VIII.

Chapter II: NATURAL FORCES.

ALTHOUGH the class of forces dealt with in the first chapter may be deemed crude enough to menace the sunny side of plant management considerably, the subsequent paragraphs will furnish evidence that natural forces really are the ones that put nag in management. However violent and obstinate mechanical forces may grow, their refined character cannot easily be overlooked in comparison with natural forces of the kind plant management has to contend with. The forces previously spoken of in connection with the manufacturing end were subjugated into better manageable conditions by the application of brickmaking machinery, while the agents chiefly contributory in the burning and drying are mostly employed in the primitive form nature gives them, hence called "natural forces." It is true, though, that certain equipment is also used in the burning and drying—kilns, dryers—which might be assumed as having a refining effect in a similar manner as the machinery preparing and shaping the clay. Such a condition would be very desirable, but it does not exist save to a very limited extent. The ordinary structures in which the burning and drying processes are performed merely house and protect the ware against outer influence, while the factors actually promoting said processes—air, fuel, heat—are used in their original state.

Therewith is given an explanation for the cause of difficulties met with whenever it comes to the burning and drying of clay ware. There can hardly be a brickmaker not fully aware of the fact that these are the branches of his business that were hardest to become familiar with, and that the most serious troubles, especially those insurmountable-looking ones, are in the burning and drying. This condition is entirely due to the crudity of facilities. Would it be possible, at reasonable expense, to extract the oxygen from the air, and to use pure carbon instead of coal, the common burning troubles would diminish very surprisingly, because we could then procure and use the two agents of combustion—carbon and oxygen—in uniform qualities at all times, and we could readily feed them in the exact quantities theoretically required for complete and perfect combustion. The result would be that no pyrometer or cones would be necessary to tell when the kiln was done—not at all; we would know exactly from the amount of either carbon or oxygen consumed what degree of heat there must be in the kiln. Regardless of the fact that this condition does not prevail in the practice, it represents the fundamental law of burning and combustion, for which reason I shall endeavor to use it as a basis in reviewing burning in general.

It may interest the reader to figure once how much carbon and oxygen it would take if the two were used in a pure state, to produce the heat required for burning a thousand brick at 1,100 deg. C. (2,012 deg. Fahr.). To accomplish this, I'll assume the weight of a thousand brick at 2,500 kg. (5,500 lbs.), and the temperature of the brick at 0 deg. C., the specific heat of green brick being 0.22, consequently would be required:

$$1{,}100 \times 2{,}500 \times 0.22 = 605{,}000 \text{ calories of heat.}$$

In this connection must be explained that according to old-established rules, the complete combustion of one kilogram of carbon requires about 2.63 kg. (or 2.04 cbm.) of oxygen. The calorific power obtainable therefrom would be

$$1 \times 8{,}100 = 8{,}100 \text{ calories.}$$

Now, then, to produce the amount of heat we are looking for would necessitate to burn

$$\frac{605{,}000}{8{,}100} = 74.7 \text{ kg. (or 164.3 lbs.) of carbon,}$$

and

$$74.7 \times 2.04 = 152.4 \text{ cbm. (or 5,380 cubic feet) of oxygen.}$$

Before these figures could be used for a comparison with actual conditions as found on the average kiln we should necessarily make a reasonable allowance for unavoidable losses, due to the fact that the structure of any kiln will absorb its quota of heat units, while still another quantity of heat will radiate from the kiln during the course of burning. These losses shall be temporarily assumed at 150 per cent., the number of calories required for burning the thousand brick. At a later stage of this writing this subject will be exploited more fully, and it will then be shown that this assumption very nearly corresponds to the maximum losses occurring under actual plant conditions. Thus the unavoidable losses will be per thousand brick:

$$\frac{605{,}000 \times 150}{100} = 907{,}500 \text{ calories,}$$

which identifies

$$\frac{907,500}{8,100}=112 \text{ kg. (or 246.4 lbs.) of carbon,}$$

and

$$112\times2.04=228.5 \text{ cbm. (or 8,066 cubic feet) of oxygen.}$$

Furthermore, ordinary kilns are fired with commercial brands of fuel, as coal, oil, gas or wood, which in some instances are gasified, or transformed, respectively, in separate producers before being introduced into the furnaces. None of the various grades of fuel commonly used for brick burning occur as pure carbon, but in composition with other elements, which partly increase and partly lower the calorific power of the fuel. At this stage of writing I must refrain from entering into an explanation on this particular subject; most likely, however, I will give some data on fuel later on. At this instant it will suffice to assume the average heating value of American bituminous coal at 7,000 calories (or 13,000 B.t.u.'s), which will assist in furthering the data for the anticipated comparison.

Whereas the heating power of carbon was previously calculated at 8,100 calories, it becomes apparent that a larger quantity will have to be burnt to liberate the same number of heat units, if bituminous coal is used in place of the former. Hence:

$$\frac{(74.7+112)\times8,100}{7,000}=216 \text{ kg. (or 475.2 lbs.) of bituminous coal.}$$

Therewith is presented an interesting figure to those using bituminous coal in burning their products, for it indicates the number of pounds that should, theoretically, suffice to burn a thousand brick in ordinary kilns at a temperature of about 2,000 deg. Fahr. For other grades of fuel a comparison can be obtained through multiplying the concluding figure by 13,000, and then divide by the number of B.t.u.'s contained in one pound of the respective fuel=Y; thus:

$$\frac{475.2\times13,000}{Y}$$

I am not ignorant of the fact that in some instances the consumption of fuel in the burning stays fairly below the theoretic amount stated, yet the kiln records of most clayworking plants concede their burning to involve much higher fuel consumption. This puzzling condition invites argument, and could but prematurely be constructed as evidence of the invalidity of the preceding calculation. Owing to the vital importance of this topic it seems worthy of further exploitation in the successive installments, which shall be devoted to an exhaustive discussion and explanation of the reasons *why* the expenditure of fuel is less in some kilns and more in others.

(To be continued.)

TRAINED MEN FOR RESCUE WORK IN MINES.

The Bureau of Mines, Department of the Interior, in a report issued recently, prints as a roll of honor the names and addresses of the miners throughout the country who have taken the bureau's course in mine rescue work from July 1, 1914, to June 30, 1916. Copies of this report are being sent to every mine operator and state mine inspector in the country, in order that in the event of a disaster in his district or at his mine he will be able at once to determine the nearest available trained men for rescue work. Mine owners in the past have co-operated in this manner as much as they could, but have sometimes been badly handicapped and delayed in endeavoring to learn which miners have been trained in rescue work. The report gives the names and addresses of more than 3,000 men.

Written for THE CLAY-WORKER.

BRICK NEWS FROM EVANSVILLE AND SOUTHERN INDIANA.

BRICK MANUFACTURERS in Evansville and southwestern Indiana report that trade conditions have not improved any during the past month or six weeks, and no change is looked for during the balance of the year. The manufacturers in Evansville report that their local trade has not been any too brisk for several months past, and their out-of-town trade has only been fair. The manufacturers are having a lot of trouble because of the labor shortage, and reports received at Evansville from other points show that this trouble is handicapping many manufacturers everywhere. The Standard Brick Manufacturing Company, at Evansville, has raised the wages of its men three times since last December, in the hope of keeping the men, and notwithstanding this the company is now short on help and the situation grows worse as more men are taken from time to time for the great national army. A part of the time the large plants of the brick manufacturing company have been shut down because of the shortage of labor, according to John Andres, the secretary and treasurer of the company. He thinks the situation is a most serious one for the manufacturers, not only of brick and tile, but men engaged in other manufacturing lines. The trade outlook is not at all encouraging at this time, but Mr. Andres says the manufacturers are forging ahead and doing the best that they can under the existing circumstances. The brick and tile manufacturers are now paying higher wages than were ever paid before. But with the young men going to war it is expected that the many industries of southern Indiana will continue to remain short on labor for some time to come.

Henry Clemens, manager of the large sewer pipe factory at Cannelton, Ind., and formerly mayor of that city, was in Evansville on business a few days ago and reported that trade is holding its own very well in his city. Mr. Clemens is one of the most enterprising citizens of Cannelton and has been successful in his line of work.

The Louisville & Nashville Railroad Company is building an ice house in its yards at Howell, a suburb of Evansville, the brick for the structure being furnished by the Standard Brick Manufacturing Company. This same company is also furnishing the brick for the new Junior High School building at Evansville. The excavating for the school building has been completed and it is expected that the brick work will start at once. The structure when completed will cost in the neighborhood of $200,000. The Standard Company is also furnishing brick for two handsome brick residences in Evansville. One is being built for A. F. Karges, a wealthy furniture manufacturer and bank president, for his daughter, while the other brick house is being erected for F. J. Scholz, Jr.

The two large brick concerns at Huntingburg, Ind., have been doing a very nice business this season and the plants have been run on pretty good time.

The new high school building at Boonville, Ind., being built at a cost of about $50,000, is about completed. The structure is of brick and the brick was furnished by a Boonville concern.

Work is progressing nicely in the improvement of the several brick streets at Grayville, Ill., a live town a few miles southeast of Evansville. When completed it is expected that Grayville will have more brick streets than any other city of its size in southern Illinois.

The Indiana State Highway Commission has put its "O. K."

on the proposed market highway running from Evansville to New Albany, Ind., and this is good news to the brick manufacturers in southern Indiana, and an agitation has been started to have all or at least a part of the highway made of brick. It is pointed out that no material would be more endurable than brick, and a road made of this material would last for more than a generation. The towns along the proposed highway are taking up the agitation and will push it for all it is worth. Some of the roads between Evansville and New Albany will require little grading, and it will require but little labor to get them ready for the laying of the brick. John Andres, secretary and treasurer of the Standard Brick Manufacturing Company at Evansville, is an enthusiastic booster for brick roads, and says they cannot be beat.

The three large potteries at Evansville have had a fine season and the plants have been operated on full time practically all year. They are among the largest industries in Evansville and employ several hundred men at high wages.

A. HOOSIER.

Written for The Clay-Worker.

SEEN IN NEW JERSEY.

SOME IMPROVEMENT is reported in building activities in the district in and adjacent to Paterson during the past month. While this improvement is not yet noticeable in large buildings, the fact remains that inquiry for brick is larger and that sellers have been offered more orders than they have accepted. Nathan H. Sloan, representing the Garner Brick Works, of Haverstraw, N. Y., has sold 800,000 to be used in the construction of a government arsenal, or something similar, at Lake Denmark. Other agents report fair orders for brick, but none as large as that.

Common brick are selling at $12.00 on the job. The freight rates vary and the seller gets gray hair trying to get transportation to get his sales through to their destination. Every agent in this vicinity is behind in his orders. One says that he is more than 500,000 behind and sees no means of catching up. Lack of help at the yards and lack of shipping facilities are the responsible factors in this contest. It is impossible to get cars, but if one is sufficiently fortunate to have cars assigned to him, the chances are he will have no one to do the loading. Such a combination is making the brick business a nightmare.

But despite these difficulties, brick men are keeping up their courage and are getting all the brick they can to the jobs. Selling agents are exhausting every expedient to get their brick delivered. Some of them are pretty active fellows, and the way they stir things up is a caution to slackers, but when the cars and the men are both lacking they cannot be criticised for not getting their sales through.

The motor truck is coming to the assistance of some of them, but in this field war needs are paramount. Firms who provided motors last year are in clover, since they are putting their sales on the job in record time, as compared with the deliveries by train. But those who did not provide trucks last year will wait nearly a year for deliveries, at the earliest. Transportation seems a problem for which no adequate solution is available at present.

Along the Hackensack the sheds are all busy with their fall burnings. Some are active now who have done nothing heretofore this season. While the yards are not operating to capacity, they are as near so as the number of employes permits. A few have their kiln sheds filled, but most of them are burning only a portion of their capacity. The arches cover not more than one-half, or perhaps one-third, of the space. It is all they can do with their help problems in the condition they are now. Higher prices and repeated calls from interests unable to secure brick elsewhere are responsible for the awakening of the Hackensack yards at this time.

In the Raritan district several yards have been forced to shut down because they couldn't get help to continue the work. The orders which would have gone there have been switched to other yards, but everywhere the same problem is presented, and no one can be certain that he is to get the brick he wants, no matter whether his orders go in early or late. The filling of an order has passed pretty nearly out of the hands of the manufacturer. He is dependent upon labor and transportation, and finds it extremely difficult to get either one.

Newark is on the eve of a great building development which will surpass anything the city has ever enjoyed before, and its growth has been unusual. One of the largest shipbuilding plants in the world has begun operations in the Newark meadows, and as soon as it gets fairly into operation will employ 15,000 hands. No available men, or at least not many, are to be found in Newark. They will have to come from elsewhere. Furthermore, no more houses or apartments are vacant in Newark and vicinity. Houses will have to be erected for the benefit of these people. No one knows how it is to be done, but some are considering the question and preparing to assume their share of carrying out the project. Other huge plants are shortly to be located at Port Newark, but this plant has begun operations and must be reckoned with in the very near future.

A. L. B.

DOMESTIC CLAYS IN PAPER MAKING.

For many years all the clay used as filler in paper making was imported. Manufacturers believed it impossible to obtain domestic clays which would serve the purpose. Early experiments were unsatisfactory for one reason or another, and therefore manufacturers continued to use imported clays.

Some years ago the Technical Association of the Pulp and Paper Industry began a scientific investigation of this subject. One report was issued sometime ago. Another was read at a meeting of the association in Holyoke, Mass., the last week in September. J. D. Rue and C. W. Hallahan reported the results of their laboratory work which were remarkably favorable to the domestic clays.

In the first experiment domestic clay, in proportions varying from 1 to 20 parts in 100 parts of fiber, gave a retention of 20 per cent. when 11.5 parts of fiber were used.

The second experiment was conducted by using alum, and no change was observable. Talc retention was increased.

When no alum or size was used English clays gave a much lower retention than domestic.

With a 3 per cent. addition of alum the domestic clay gave a much higher retention than English clay.

With a 3 per cent. addition of alum and 2.5 per cent. addition of size the two clays gave substantially the same relative retention.

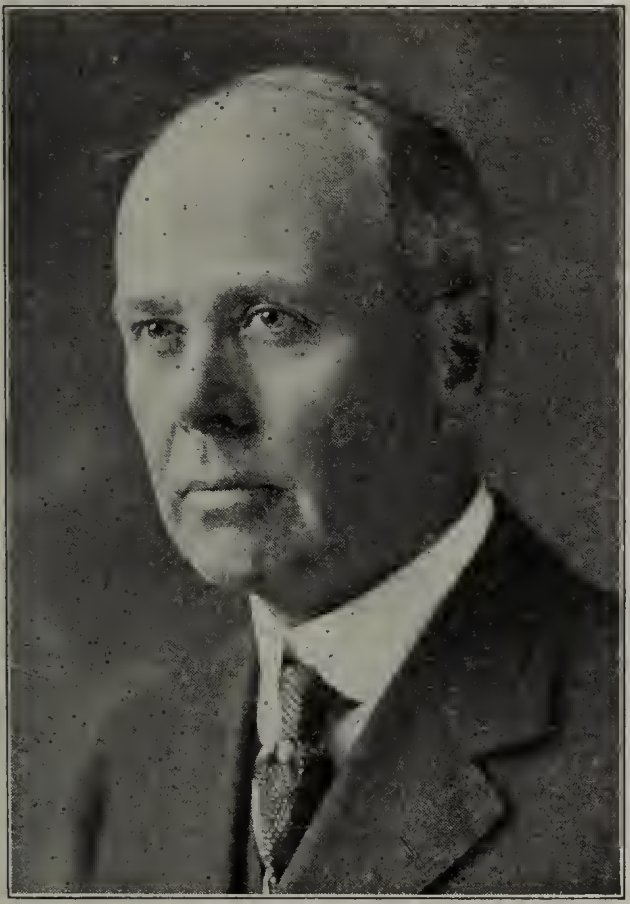
The results of these experiments are to demonstrate that retention of the domestic clays is much larger when used without either alum or size than foreign clays. In other words, it is a cheaper filling than the foreign because it does not require so much, and both alum and size can be left out with assurance that a fair degree of retention will follow.

With such an abundance of excellent clays suitable for this purpose ready for development all through the South, these experiments should be of special interest to paper manufacturers. In a campaign for reduction of manufacturing costs no question of which clay can be most profitably utilized need remain.

The situation which this report opens is emphasized by the displays of specimens of suitable clays taken from deposits in the South which are inexhaustible. Just what quantity is used in paper making is not known outside the industry, but it is a source of consumptive demand which will benefit producers, and if domestic clays can be used instead of foreign, the clay mining industry will benefit in that proportion.

THE CLAY PRODUCTS ASSOCIATION ESTABLISHES HEADQUARTERS AT CHICAGO.

AN ORGANIZATION which is destined to play an important part in promoting and extending the use of vitrified salt-glazed sanitary sewer pipe, segment block, etc., and the maintenance of high standards in their manufacture, has recently been perfected under the name of the Clay Products Association and headquarters established at 912, 913 and 914 Chamber of Commerce building, Chicago. The association is really the outgrowth of the International Clay Products Bureau, which has been maintained for a number of years at Kansas City, Mo. This bureau was a member of the American Society for Testing Material for many years, the members serving on committees on standard specifications and tests of sewer pipe and drain tile, known as Committees C-4 and C-6. The new organization will have complete testing, chemical and analytical laboratories and be in a better position to co-operate with the society in every way.



Geo. H. Tefft,
Secretary-Manager Clay Products Association.

The membership of the Clay Products Association will be limited to manufacturers of clay products in the United States and Canada, particularly vitrified, salt-glazed, sanitary sewer pipe, segment sewer blocks, drain tile and vitrified wall coping, fire clay flue linings and chimney pipe.

The association will co-operate with the United States Public Health Service and state and local boards of health for improving sanitary conditions, and will also co-operate with the fire prevention societies and with the National Board of Fire Underwriters, to bring about better construction of buildings, especially chimneys, by securing the enactment of state laws, city ordinances and building codes requiring the use of fire clay flue lining, and thus reduce the enormous waste and loss of property by fires that are caused by defective flues. The association has offered the services of its engineers to the U. S. Government in its endeavor, through the Department of Agriculture and the various commissions, to increase the production of farm products by encouraging the drainage of wet and superirrigated lands.

It is the desire of the association to co-operate with various traffic bureaus of the railroads in their endeavor to improve methods of loading and unloading and the transportation of clay products, and to secure just and equitable freight rates between railroads, manufacturers and consumers. Especial attention is being given at this time to securing the maximum loading of cars. The association will carry on an active and vigorous campaign in conjunction with good roads magazines for the better drainage of wagon roads and the construction of hard-surfaced wagon roads.

Approximately thirty of the principal manufacturers are charter members of the association, and it is expected that within a few months all of the manufacturers of vitrified sanitary sewer pipe and blocks, wall coping, drain tile and fire clay flues and chimney pipe will become identified with the association and assist in carrying on a broad, constructive publicity and promotion campaign—a campaign that will not stop with engineers and dealers, but one that will extend to the consumers, so they may know and appreciate the advantages of building their sewers, drains, chimneys, road culverts, etc., with vitrified clay that will endure and be sanitary always. The endeavor will be to create good will for today and for the future.

The officers of the association are: President, L. G. Blackmer, Blackmer & Post Co., St. Louis; vice president, E. S. Hoyt, Red Wing Sewer Pipe Co., Red Wing, Minn.; treasurer, J. L. Scott, Macomb (Ill.) Sewer Pipe Co., and secretary and general manager, George H. Tefft.

Mr. George H. Tefft is eminently fitted for the office of secretary and general manager, for he has spent most of his business life in the clayworking field. He is a native of Missouri, having been born at Springfield, that state. After graduating from Drury College he was manager of the jobbing department of a large packing house, but in a short time became associated with the W. S. Dickey Clay Manufacturing Company, of Kansas City, and served that company as secretary and general sales manager for fifteen years. For the last eight years, in addition to his duties with the Dickey companies, Mr. Tefft has been secretary of the International Clay Products Bureau. He was also a director of the Clay Products Exposition, which held two splendid expositions in Chicago at the time of the annual meeting of the National Brick Manufacturers' Association.

Mr. Tefft is very enthusiastic over the new association, which he says has long been one of his pet dreams. He has already outlined a plan for a broad, constructive publicity campaign, that he says will not stop with engineers and dealers, but will reach the consumer, that he may know and appreciate the advantages of vitrified clay products.

IMPORTANCE OF TEAM WORK.

The greatest factor in industrial efficiency is neither science nor system so much as team work. No matter how good the system or how much analytical science is brought to bear, not much in the way of efficiency is accomplished without co-operation among all concerned, without a splendid order of team work. Given the team work and good results can be accomplished almost anywhere any time. So, with lessened forces one of the things to strive for is effective team work. It is a good idea to have committee meetings and if in these one man from one department thinks another could be handled better than it is, shift him around and let him try it. Let the committee meetings have for their purpose team work and co-operation, not fault finding and factional divisions. The scarcity of help is rendering it imperative for every industrial institution to get the best practical results with the least amount of energy, and the only way to get the best results is by all working together for the common good. Let us put in a part of the winter months, therefore, inaugurating the idea of team work through better understanding and fuller co-operation all around.

CO-OPERATION ORGANIZATION } FOR EFFICIENCY

TO BE KEYNOTE OF THE NATIONAL PAVING BRICK MANUFACTURERS' ASSOCIATION ANNUAL MEETING.

Conference of the Paving Brick Industry to Be Held in Cleveland, November 19 and 20, 1917.

OUT OF WAR conditions, the breakdown of railroad and express companies to move crops and supplies and the extraordinary demand for better roads, the paving brick industry has been confronted with problems the solution of which lies in study and conference on the part of all manufacturers. The annual meeting of the National Paving Brick Manufacturers' Association will be the occasion of such a conference, to which are invited all manufacturers of paving brick.

A Typical Road Scene Near Cleveland, Ohio.

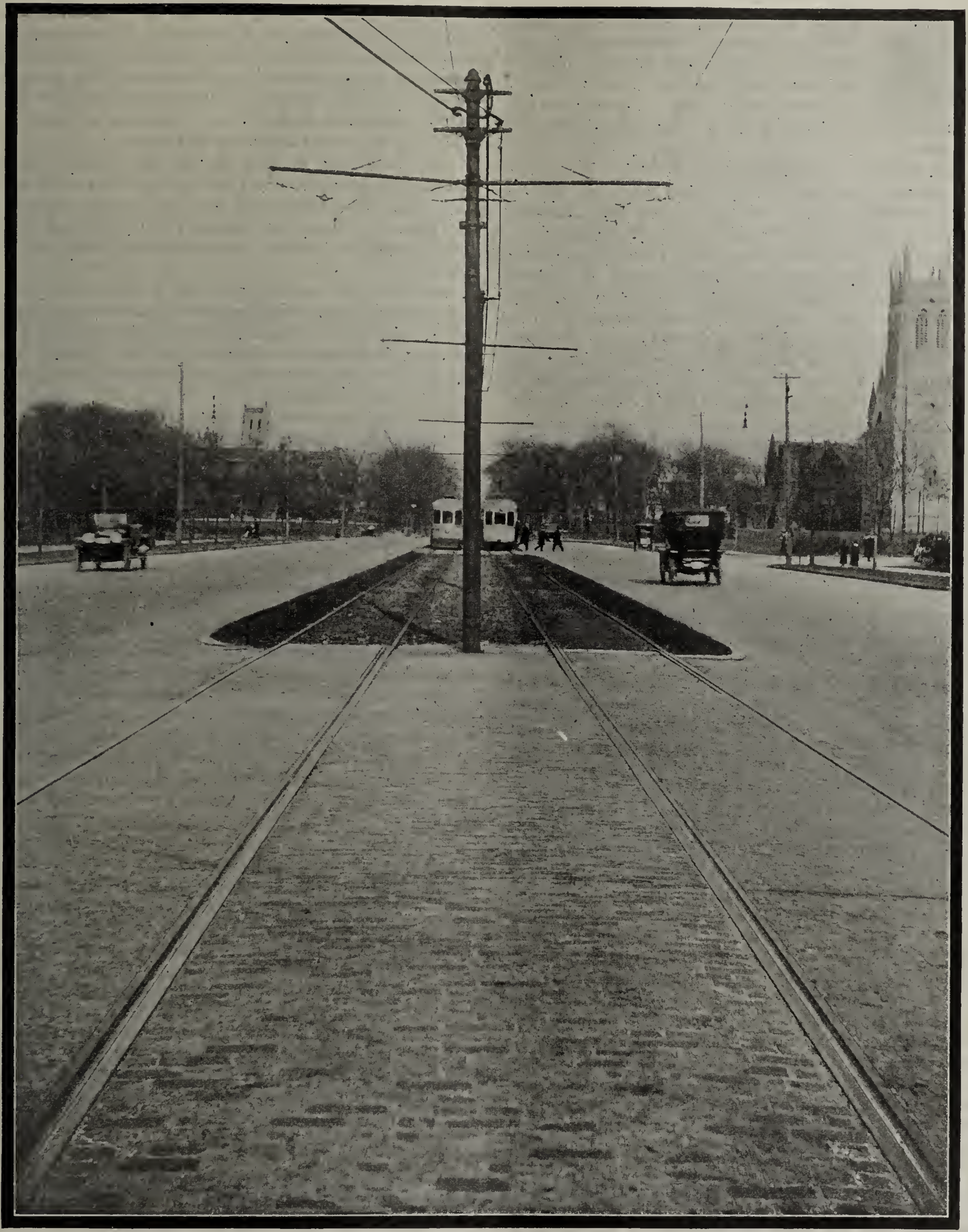
As evidencing the spirit of the meeting, the Office Board of the Association says:

"The complex situation arising from the country's requirement for the greatest transportation facilities—with that very need hindering the receipt of materials and fuel needed in the manufacture of brick, as well as delaying paving work which should furnish transportation relief—with the Council of National Defense recommending short haul freight to be transported over the highways—which are not—presents problems seldom found in business experience."

The Office Board of the National Paving Brick Manufacturers' Association is convinced that more good to the country and to the industry can be effected by a conference in which the entire industry is represented by its active executive officials than by any other undertaking.

We have concluded, therefore, to call a general conference of the paving brick industry to be held in Cleveland, Ohio, November 19 and 20, 1917. All members of firms, board members of companies and other persons having financial interests in the business are invited and urged to attend this important meeting. The program for the meeting is under preparation, and this, together with detailed information regarding the meeting, will be sent all manufacturers of paving brick as soon as prepared.

The agricultural machinery people are doing their bit to help feed the world, and the result is more labor-saving machinery on the farm and for farm work than ever was dreamed of in the history of the country. They are not only supplying this country, but the export trade in agricultural implements has climbed up again until the total for last year was $26,552,826, practically double the exports of the two previous years.



University Circle, Cleveland, Ohio. An Ideal Pavement for Either Light or Heavy Traffic at Any and All Seasons of the Year.

Written for The Clay-Worker.

THE CHICAGO SITUATION.

AFTER HOPING for month after month that a decided improvement in the building market would manifest itself, it appears sadly evident that Chicago's building record for the year 1917 will certainly be the poorest it has had for one and possibly even for two decades.

At that, business is limping along, and, since it is wartime and the present slackness is due to the inevitable shift of economic tendencies due to that fact, the building material men of this Mart o' Trade expand the same broad but tight-lipped smile of grim cheerfulness that a fellow wears as he digs up his last ready cent for a Liberty Bond or marches up the gang-plank of a transport on his way to the other side and the trenches. Outwardly they comfort themselves that at least they do not have to worry about any excess profits taxes as do some of their fellow citizens in other lines. But, confidentially, it is to be suspected that more than one or two of them would be dead willing to take a chance with the new Federal taxes just for the personal experience of knowing what an "excess profit" really is like anyhow.

Since June the number of building permits taken out each week have ranged from 43 to 138 below the number taken out during the corresponding period of 1916, and the difference in involved expenditure in some cases has run well over a million dollars. Only in the last week of August of this year did the estimated expenditures exceed those for the corresponding week of a year ago.

The figures, of course, do not by any means mean that building is at a standstill. Nor is it quite correct merely to say that building activities are curtailed. To be sure there is not the same amount of activity in office buildings and skyscrapers that has been seen normally in past years, and, naturally, with thousands of men on their way to war and thousands more likely to be called out within the next year or so, there is a very noticeable falling off in the construction of residences, especially apartment dwellings. On the other hand, in purely industrial lines there is an exceedingly brisk movement, and new factory and manufacturing projects are coming to the front all of the time. Whatever is basically needed must be supplied and the lines that must furnish supplies during wartime are rapidly preparing to do it, and even are enlarging plants or building new ones when that is necessary, as it generally is. The government, too, has gone into the building business to some extent. In addition to the activity in factory building in the industrial belts and on the outskirts of the cities, a considerable amount of permanent building in rural communities may be expected. New and larger storehouses, bins and outhouses for crops will be needed, and it is safe to predict that the necessity for fireproof construction will call for a large amount of clay-product material.

Already some of the building material people are beginning to have cause to believe that the experience of Canada, where a decided depression for some months immediately after the entry into the European war was followed by a strong reaction which still continues, will be the experience throughout this country.

One of the next year's activities sufficiently in evidence to be recorded now is due in part at least to the normal development of the city. Hill, Clarke & Co., dealers in machinery, have purchased a site for a new plant at 647-49 West Washington street, and the work of tearing down the present old brick improvements and replacing them with a modern structure will begin on May 1 next. This company is the last of the machinery houses to leave Canal street in the general exodous westward.

The W. F. Hall Printing Company has its program under way for a $900,000 building to be put up as an addition to its present plant. When the new building is finished the company will occupy the entire block bounded by Chicago avenue, Townsend, Kingsbury and Superior streets. The building will be seven stories, of heavy mill construction, with exterior walls of brick and Bedford stone. The new building and the old will be connected above the first floor.

The Harrington & King Perforating Company, manufacturers of perforated metals, have purchased a site on the west side, South Campbell avenue and the railroad right of way, and plans to improve the property with one and two-story factory buildings of heavy construction and about 400 feet in length.

Not all of the activity, however, is confined to industrial enterprises. A comfortable amount of miscellaneous construction is observable. Even downtown is not devoid of building interests, as witness the construction of the Al Wood's theater and office building at Randolph and Dearborn streets, which is worth a story of its own.

Also, the Old Colony Insurance Company is said to be considering the erection of a sixteen-story office building at 166-172 West Jackson boulevard, and may decide to begin actual construction work very soon.

Even in times of war and stress Evanston has to be right up to the minute, and a new $700,000 hotel is soon to take the place of the old Avenue House at Chicago avenue and Davis street. In type it is to be suggestive of the domestic architecture of the Elizabethan period. The exterior walls are to be of variegated red brick. The upper stories are to be of stucco and half timber and the gabled roof of slate. Along Davis street and Chicago avenue on the first story will be shops, and the deck over these will be used as an open air terrace with entrance from the second floor of the hotel. The terrace will have a balustrade parapet wall. The entrance from Chicago avenue will lead through a garden into the lobby, giving vista through to the fountain and garden wall of the patio, from which will open the ballroom and dining room. The top floor will be largely given over to a solarium, giving a fine view of the lake.

Work is well under way on the Norwegian-American Hospital, located on the half block bounded by Cortez and Thomas streets, Francisco avenue and the alley, which is to cost upward of $100,000, containing sixty-five private rooms for patients and five wards. Some of the rooms will be large enough to care for two patients. In addition there will be apartments for the nurses containing twenty bedrooms and two parlors. The hospital will be of modern equipment.

Another high grade apartment building to cost $300,000 or more is in contemplation for Sheridan road overlooking the Lincoln Park yacht harbor. It is to be put up by J. H. Murphy on a site recently purchased from Benjamin Allen, 100 feet north of Roscoe street. The building is to be nine stories in height and to contain seven apartments of fourteen and fifteen rooms each.

A lively controversy is now on between the city council and the building commissioner over the issuance of a permit for a new annex to the Blackstone Hotel, and is of very material interest to every building man and also to every lover of uniform and harmonious architecture in the city. To understand the whole story it should be remembered that the graceful Blackstone Hotel, which lends so much charm to Chicago's water front, was erected several years ago, and before the present restriction prohibiting the erection of any building above a height of 200 feet was enacted by the city council. The present building exceeds this restriction by considerable, and to present a symmetrical and desirable whole the annex should, naturally, rise to the same height as the present building. The plans as prepared and submitted to Building Commissioner Bostrom called for a building of this height, conforming to the general architectural style of the Blackstone Hotel. The commissioner issued the permit. Shortly after this the city council reconvened after a summer recess and an order was introduced directing the commissioner of buildings to rescind this permit on the ground that it violated the ordinance restricting the height of buildings in the city. This order was referred to the committee on buildings, which, however, rather promptly reported it back to the council with recommendation that it be passed. With almost equal promptitude the council passed the order.

The building commissioner, however, stood by his action and declined to rescind the permit. It is understood that he contends that the annex is in the nature of an addition to the original structure, and that it is in the interest of good municipal architecture and sound city planning to have the two parts of the same building uniform in appearance. This sounds like good sense, and it is likely that public opinion will indorse this view. As the situation stands, however, it probably will require a decision of the State Supreme Court to settle the question. Inasmuch as it was not intended to start building operations earlier than next spring, it may be that with expedition a decision can be obtained so as not to interfere with the new annex. The cost of the proposed new hotel structure is estimated at $1,600,000. SCRIP.

"THE BEST FERTILIZER IN THE WORLD."

Seven hundred and seventeen bags of fertilizer marked "New Jersey Agricultural Chemical Company, Hoboken, N. J., the Best Fertilizer in the World," were seized and condemnation proceedings brought in the British prize court. The point was urged that the bags did not contain fertilizer at all, but an artificial compound containing a great deal of cotton oil which could be easily separated out. It was consigned to Gothenberg, Sweden, and it was held to be a clever dodge to get the much needed fat into Germany.

THE COLUMBUS BUILDING SHOW.

PLANS ARE NOW SHAPING UP for a general building conference to be held in connection with the Real Estate and Building Show, January 21 to 30, 1918, at the Ohio State Fair Grounds, in Columbus.

The Ohio Builders' Supply Dealers' Association, Ohio Retail Lumber Dealers' Association, Agricultural Lime and Limestone Association and the Union Association of Sash and Door Salesmen have already decided upon dates within those stated above for their conventions, in order to participate in the conference, assuring a total attendance to date of 2,200. Other associations are giving favorable attention to these dates in calling their conventions in Columbus, and some will call special meetings at that time in order to share in the building conference. During this time, Farmers' Week at the Ohio State University will be in force, bringing 5,000 farmers to Columbus, many of whom will be interested in the conference and building exhibits.

About 40 per cent. of the available 53,300 square feet of exhibit space in the building show was sold during the first week after the sales opened, and the exhibition now bids fair to be the largest of its kind.

J. E. McNally, president of the Columbus Builders & Traders Exchange, is president of the building show; Chas. F. Johnson, president of the Columbus Real Estate Board, is first vice president; Wm. H. Conklin and F. O. Schoedinger, both former presidents of the Builders' Exchange, are second vice president and treasurer, and Sam E. Neff is secretary. Neff is secretary of the Real Estate Board and executive secretary of the Ohio Association of Real Estate Boards. L. C. Vinson, of wide experience in like projects, has been given active management of the show.

THE GANDY BELT—BEST IN THE LONG RUN.

THE ACCOMPANYING ILLUSTRATION shows the Gandy belt ready for shipment—it is over ⅛ mile in length, weighs 6,000 pounds, 36 inches wide, 8-ply. This belt is a product of The Gandy Belting Company, Baltimore, Md., the inventors and largest makers of stitched cotton duck

The Gandy Belting Company operates the largest factory belting.
in the world devoted exclusively to the manufacture of stitched cotton duck belting. "The Gandy Belt" is giving splendid service as a drive belt, and also when used as "conveyor" or "elevator" belt for material of every description.

The foundation of "The Gandy Belt" is the special weave of extra heavy cotton duck woven in their own cotton duck mills. The belts are sewed with a heavy "Seine Twine" on sewing machines built in their own machine shop. These machines have patented features possessed by no others, and stitch with an "Imbedded Stitch," holding the plies of the belting solidly together and making the surface of the belt smooth. The belt is then saturated in a compound of the purest oils, making it water, steam and heat proof.

A Huge Roll of Gandy Belting.

The Gandy guarantee protects you against all risk. "The Gandy Belt" is warranted to be uniform in quality; to run straight and true; to be of the best material and workmanship. Any belt found defective in any of these respects will be promptly replaced. See their ad on page 302.

In some of the cities where war work is a big feature, the housing problem has become such a serious one that the authorities at Washington have been appealed to to help out. The problem seems to be that of providing temporary shelter for the winter, and the indications are that in some of the cities building efforts will be continued right through the cold weather.

CORRESPOND-ENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Unbreakable Doll Heads.

Editor The Clay-Worker:

Will you kindly tell me whether the process by which the unbreakable doll heads are made in America is patented. If not, will you tell me where I can learn one of the best processes. We desire to use the information in connection with our College of Industrial Arts, at Denton, Texas.

EDWARD P. GILCHRIST.

Will Start Brick Plant.

Editor The Clay-Worker:

Please send us a copy of your latest issue of The Clay-Worker, and advise us the subscription price. We are contemplating going into the brick manufacturing business and, of course, want to take the paper regularly.

Thanking you, we are,

Respectfully yours,

Hamtramck, Mich. ENGLEMAN MFG. CO.

Chimney Blocks Wanted.

Editor The Clay-Worker:

We would like to get in touch with a factory making chimney blocks, which could furnish us with blocks for 8-foot and 6-foot chimney, having 8-inch, 6-inch and 4-inch walls. If you can direct us to any one making these blocks, we would appreciate it very much.

Yours very truly,

Springfield, Ill. SPRINGFIELD DRAIN TILE CO.

New York Firm to Erect Clay Products Plant.

Editor The Clay-Worker:

We are interested in erecting a plant for the manufacture of fire brick, roofing tile and vitrified tile pipe, and we would very much appreciate your furnishing us with a sample copy of your magazine, The Clay-Worker.

Thanking you, we are,

Very truly yours,

CALCAVECCHIA, ABALLI & CO.,

165 Broadway, New York City. C. S. Streva.

What Effect Does Salt Have On the Burned Brick?

Editor The Clay-Worker:

We would like some information relative to salt glazing. Does salt mixed with shale tend to give a red color to your brick, and will salt cause white wash in the product?

Thanking you in advance for your kindness, we are

Yours truly,

THE CLAY PRODUCTS CO.

(Salt has a tendency to retard drying, as it retains water for some time, and so has a tendency to whitewash; it is an aid to produce vitrification at lower temperatures, but does not aid in producing a more or better red. The intensity of red color is largely dependent upon the percentage of iron the clay contains, the physical and chemical condition which exists in the clay, and the color is also governed by the mode of firing and burning.)

To Build a New Brick Plant in Wyoming.

Editor The Clay-Worker:

Will you kindly mail me a copy of the last issue of The Clay-Worker. I intend to erect a brick plant here shortly and want to get in touch with brick machinery manufacturers and know I can do so through The Clay-Worker. I was formerly connected with the F. H. Goss Brick Co., at Tacoma, Wash., and am an old-time subscriber to your paper. I would like to get some data on burning with fuel oil.

Yours truly,

Casper, Wyo. F. H. GOSS.

Wants Fire Clay High in Alumina.

Editor The Clay-Worker:

We are looking for a high-grade flint clay mined in Pennsylvania. This clay is to be used in the manufacture of fire brick. We particularly want one high in alumina. The New Jersey fire clays are high in silica and low on alumina. We thought that perhaps you knew of someone having this material for sale. Any information that you might give us would be greatly appreciated. With best wishes, we beg to remain,

Very truly yours,

AMERICAN ENAMELED BRICK & TILE CO.

South River, N. J. Chas. L. Tacquart.

Information Wanted Relative to Hollow Tile Machinery.

Editor The Clay-Worker:

I have just recently subscribed to The Clay-Worker and would like to have you give me some advice. We have a good clay deposit about a mile from our town, and the prospects are very good for starting a hollow tile plant out here. Can you give me a fair estimate about how much it would cost to establish a tile plant of about 10,000 daily capacity. Is the round down-draft kiln the most economical to build and burn, and how much would a round kiln, 30 feet in diameter cost? What kind of machinery is best for hollow tile?

Truly yours,

Taylor, N. Dak. WM. SOINI.

The Clay-Worker Invaluable.

Editor The Clay-Worker:

Replying to your favor of recent date, enclosing bill for subscription to The Clay-Worker, beg to say that I have instructed stationers at Oxford to renew my subscription to this publication when it expired. If you have not heard from them to this effect, kindly notify me and I shall send my personal check for the amount. May I not take this opportunity to tell you how very much I enjoy each issue of your paper, and feel that the ideas I get from it are of valuable assistance in my work. With best wishes for the success of The Clay-Worker, and with kindest personal regards to yourself, I beg to remain,

Yours very truly,

Enid, Miss. J. H. BRAMLETT.

Washed Clays for Enamelers.

Editor The Clay-Worker:

We enamelers have been in trouble since we were cut off from German washed clays and the present two clays now obtainable are not what they should be.

Our volume of clay used is not large, but we are willing to pay twenty to thirty dollars per ton for clays that replace German washed vallender or pipe clays.

What we want is a heavy S-G plastic clay, of low shrinkage on steam dryer, that sticks to plate, dries hard, and that when washed gives a clay substance that is always free from all fluxes, making an unfusible product with enough plasticity left to hold up grit.

There is nothing about these German clays but what is duplicated in our Ball clays, but they are all unusable as an unwashed clay, and the volume used by each enameler is not enough to warrant them doing the washing themselves.

These enamelers' clays are more of a manufacturing proposition than a clay mining one, and there should be someone to take hold of this special clay business and replace these German washed enamalers' clays with an American product.

Yours very truly,
(Signed) C. N. HOOPER,
Vitreous Enameling Technologist, Cole Manufacturing Co.

OFFICIAL ANNOUNCEMENT.

THE THIRTY-SECOND ANNUAL CONVENTION OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION AND ALLIED ORGANZATIONS WILL BE HELD IN INDIANAPOLIS, IND., FEBRUARY, 3 TO 9, 1918.

MANY TIMES of recent years, members of the N. B. M. A have asked, "Why don't we have a convention in Indianapolis?" As a rule, the reply has been "Indianapolis is held in reserve for an emergency." Owing to the unusual conditions now prevalent in all industrial lines, incident to the war, it seems especially desirable this year to hold our annual convention at a central point, and as Indianapolis is but a few miles from the actual center of population of the United States, and so best meets the requirement, it has been decided to hold our next annual convention in Indianapolis, February 3 to 9, 1918.

The Hoosier capital has many other advantages which have made it renowned as a convention city. It is the greatest inland railroad center in the world, and can be reached by fast through service trains from every corner of the country, so the delegates may come from far or near with little or no inconvenience.

The Claypool Hotel Headquarters.

The headquarters of the N. B. M. A. convention week will be at the Claypool Hotel, where unexcelled facilities will be afforded. The Claypool is famous as a convention hotel; its assembly halls, spacious lobby, elegant cafes, beautiful parlors and splendidly furnished guest rooms afford accommodations rarely equalled for conventions, large or small. As in former years, it is anticipated that all allied associations will meet at the same time and suitable accommodations will be afforded for committee rooms, meeting places, etc.

The grave and important problems that now confront every branch of the clayworking industries make it exceedingly desirable for the representative men in each branch to meet and consider carefully the new conditions under which plants must be operated and products marketed. Never before was there a more urgent need for exchange of views on the various questions which are now perplexing the wisest and most experienced manufacturers in the land. Be it remembered that "in a multitude of counsel there wisdom." Every member is expected to be present and do his bit toward meeting the new conditions in a manner most apt to spell the largest measure of sucecss during the following season.

A large attendance is hoped for and a warm Hoosier welcome awaits each and every visitor. Those desiring further information relative to the program of events or the requisite of membership in the various bodies will please write the Secretary at Indianapolis.

THE EXECUTIVE COMMITTEE.
FRITZ SALMEN, President.
THEODORE A. RANDALL, Secretary.

TRADE LITERATURE

The Ball Engine Co., Erie, Pa., have issued a very unusual catalogue. It gives complete specifications of Type B Erie shovels, and is profusely illustrated with half-tone cuts of the shovel as it is used effectively in various ways and under varying conditions. A particularly interesting illustration is an outline of the shovel, showing in detail every feature of its construction, which is simple and hence in a large degree "fool proof."' If you consider a repeat order as an evidence of merit, turn to the Erie ad on page 313 and you will be convinced that the Erie full revolving shovel it is a class all by itself. Copy of the catalogue can be had for the asking. Address the Ball Engine Co., Erie, Pa.

TO BOOST FACE BRICK.

PLAN TO RAISE $300,000 A YEAR FOR THREE YEARS BIDS FAIR TO MATERIALIZE UNDER THE DIRECTION OF THE AMERICAN FACE BRICK ASSOCIATION.

REALIZING THAT THE FRONT BRICK business is handicapped by the publicity campaigns of competing materials, concrete and lumber, the American Face Brick Association will if present plans are successful be in a position in the very near future to get in the publicity game in a manner which will prove effective. It is proposed to have all manufacturers of face brick contribute on the basis of fifty cents a thousand. As the annual output of face brick is six hundred million, or more, an annual fund of $300,000 for advertising will be provided on the basis suggested. A campaign such as this would put face brick in the front rank of building materials where it justly belongs, and it is to be devoutly hoped the directors of the American Face Brick Association will succeed in their laudable efforts. It will be a splendid example for other lines of clay products to emulate.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T, A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVIII. OCTOBER, 1917. No. 4.

My Country, Right or Wrong—My Country!

CURRENT COMMENT.

Let us "carry on" with the Brick Boosting Campaign.

* * *

The reward for right doing may oft be delayed, but it is seldom denied.

* * *

The way to keep trouble from dogging your footsteps is to meet it face to face.

* * *

Let us do what we can to encourage the school boys to learn something of brick laying.

* * *

Our soldier boys when they return from the fracas will have enough experience in clay pit digging to be classed as experts in this work.

* * *

Fire brick is the only item in our export trade which has attained the million dollar mark. This item reached $3,342,192 in the export trade for the year ending with last June. By combining the earthenware and chinaware, we get a total of a little better than a million. Some day each of these latter two items should total a million alone.

* * *

The fact that the industry has produced and sold more floor tile than roofing tile sounds like we are making better progress under foot than overhead.

* * *

It is a good idea to keep in mind that the brick walk and the clay tile porch floor may add considerably to the beauty of the home surroundings and relieve the gray monotony of concrete.

* * *

The coming of cold weather should serve as a reminder of the comforts of the good brick fireplace. Why not take advantage of the occasion to distribute interesting literature on this subject

* * *

We are still importing a million and a half dollars worth of kaolin and other special clays from abroad under war conditions, notwithstanding the discovery and development of domestic clays.

* * *

The drain tile business should be pushed with unusual energy this fall and winter because the farmers have the money and the way to get increased production and better crops is through the use of more drain tile.

* * *

The scarcity of help makes more important the installation of gravity conveyors where they can be used to advantage, and mechanical conveyors for the handling of material, because all this helps out in the shortage of man power.

* * *

Good roads are now recognized as a public necessity, and in time the brick paved road will be accepted as the ideal goal. The sooner that time comes, the better it will be both for the road builders and the paving brick industry.

* * *

About the best thing that could happen to the building world would be a crushing defeat to the German army to bring peace early this winter. As long as war continues, building operations will be held in check, but once this war is ended, there will be something doing all around.

MARK TWAIN IN ERROR.

The "Country Gentleman" prefaces what is in effect a good bit of drain tile argument with the statement that Mark Twain said: "People have been talking about the weather for years, but nothing has ever been done about it." Then, just to prove that Mark was wrong, it goes on to show that a great deal has been done about the weather and its influence on crops. We have drain tiles to take away excessive rainfall, and irrigation systems to fight the drought, and many other things to provide against objectionable turns of the weather.

SOME MOTOR TRUCK LOGIC.

One of the balking places for many a man who contemplates buying a truck is the idea of having it stand still and remain idle while it is being loaded and unloaded. There is a too-general practice of getting to figuring on tonnage and mileage loss incident to its remaining idle.

The fact of the matter is that there are two lines of argument which can be put against this as a handicap. One is that while the truck is standing idle, it is neither costing anything nor wearing out, consequently the more idle hours, comparatively the longer will be the life of the truck and the less it will be necessary to charge off for depreciation and the smaller will be the up-keep cost.

The other line of argument is that of quicker time in transit. Where the haul is over an appreciable distance, the truck will cover the distance in enough shorter time to allow for its unloading and return before the team would be there and ready to unload, then the team would have to stand there and rest while the wagon was being unloaded.

There are many angles to this matter of trucks in the industry and every season we are learning something new, some new line of logic about trucks and more of them are finding their way into the business on all sides. A few more years and for any kind of teaming except in the country districts, where there are no good roads, the truck will be the exception rather than the rule if the present rate of truck progress keeps up. So, if you have been overlooking the truck business, it is a time to take the subject up this winter for investigation, because there are many new types being brought out, as well as many new ideas being developed.

INCREASE IN VALUE OF CLAY PRODUCTS.

One of the most interesting things about the brick and tile report for 1916, published in The Clay-Worker for September, is in that the value of all clay products increased. It is a better price as well as a larger production that should be a a matter of concern to every man in the industry. In fact, the better price is in some respects more important to success than a larger production. Let us make it a point to get a price in the future. Everybody else is getting more for everything else, and the clayworker must have more if he would come out even.

ELECTRIC PORCELAIN INCREASES.

That branch of our pottery product classed as electrical supplies has been making development in keeping with the progress of electricity itself. Reports now available on the production for 1916 show a total of $7,034,420. This is an increase of $2,363,218 over 1915. Moreover, 1915 showed an increase of 13 per cent. In fact, the porcelain electrical supply industry has shown an almost uninterrupted increase, the one slump in its record being in 1914, following an enormous production during the year 1913, which seems to have curtailed the needs for a year or more. Now, however, the total of 1916 we find considerably above the total produced heretofore.

It was about fifteen years ago that porcelain electrical supplies, as an item of our pottery industry, passed the million-dollar mark. After about four years it jumped into the $2,000,000 class; then in 1909, it climbed to $3,000,000, attaining $4,000,000 in 1911, and $5,750,000 in 1913, dropping to nearly $4,000,000 in 1914, since which time it has increased until the total for 1916, the biggest on record, was $7,034,420, as given above, or more than a 50 per cent. increase over the 1915 production.

This, however, is not as widely scattered as some branches of the clayworking industry. Electrical supplies are reporting from ten states, with Ohio leading. Ohio manufactured $2,181,026 worth of electrical supplies last year, New Jersey came second with $1,674,093, New York third with $1,623,433. These three states produced 78 per cent. of the total output of the country.

TURNING TO REFRACTORIES.

The demand for fire clay products has been so heavy that there has been manifested a disposition on the part of clayworking plants making other products to turn to refractories for the time being. There is no doubt, either, about there being room for increased capacity in refractories, whereas, unless building operations improve, there is in other sections more capacity than is needed, and the same may be said of paving brick.

Of course, one of the first essentials in turning to refractories with a plant that has been making pavers or common and face brick is the necessary raw material for making the new product. Material for fire clay products is not so plentifully distributed as that for other brick, but some plants have refractory raw material available of one grade and another.

Some of this would make stove linings and such products as do not call for the hard service required of other forms of refractories, so those who are inclined to turn toward refractories for a season should make a thoughtful study of their raw material in connection with the products they contemplate making to see whether it is suited for them or whether a market can be found for such products as can be successfully made from such raw material as is available.

Broadly speaking, the refractory business is a business in itself, especially the making of products for metal working industries and for like service generally. Still there is here and there an evident opportunity for the manufacturers of other clay products to turn for a season to refractories of one kind and another to help out the supply there.

INDUSTRIAL SMOKE STACKS.

Clay products people are interested in two classes of chimneys. One of the most familiar ones is that of the chimney and fireplace of the home. The other, and the one holding perhaps the biggest possibilities at the present time, is the chimney or smoke stack of the power plant. Not only the power plant of the big central stations, but of isolated industrial institutions.

It used to be that most industrial institutions turned to the metal smoke stack, mainly because it was inexpensive and could be erected quickly. For that reason, only those building for permanence were inclined to turn a favorable eye toward brick and clay products.

Now we have a condition in the metal working industries where not only is the metal smoke stack more costly than it used to be, but it is difficult to get action because of the scarcity of supplies. Moreover, the need for economy in fuel is making imperative the study and practice of more efficient methods.

We have three types of industrial smoke stacks. Those made of metal, both light and heavy; those made of concrete, and those made of brick and other clay products. Up to a few years ago we had only two types, the metal and the brick. The original stacks or chimneys were heavy massive affairs. Some of these that are very old are still standing, while others have been torn down in the course of changes that come to the industry.

Brick and hollow tile are recognized by authoritative engineers as constituting the best material with which to build a chimney or smoke stack. There are many ideas of detail and a number of special patented tiles made for chimney construction, all of which have their talking points and are worth looking into.

We need variety to satisfy the different notions and ideas of mankind and to vary the monotony of things. Moreover, there are certain conditions under which certain forms of construction are more satisfactory. So we have no fault whatever to find with the exercise of ingenuity in the development and exploitation of the many offerings of clay products for constructing chimney and smoke stacks. What we need to do is to encourage more of this that we may have fewer steel smoke stacks and get better fuel economy.

And, after all is said and done, for both economy and permanence, the old-fashioned brick chimney is a mighty good smoke stack. One can even obtain those things desired in the way of insulation and of hollow spaces by varying the form of construction.

It is said that solid chimneys are very heavy, especially if built to great height. This is really an advantage, because it enables them to resist wind pressure and makes them more substantial generally. Moreover, it is easy enough to get a brick these days that will stand all the pressure necessary under the great weight of big chimneys. Also, it is practical to construct them with hollow spaces between the outer and inner wall and to get any combination of brick and other clay products that may be desired. The brick chimney properly laid is a hard thing to beat. There may be personal preference and certain points of advantage in various hollow blocks and special chimney tiles, but, after all, when we get down to the brass tacks of the business, the old brick chimney is a good standby and certainly it is better than anything else that can be developed from concrete or any rival material to burned clay products.

TRADE LITERATURE.

AMERICAN CLAY MAGAZINE for October has a number of interesting stories in tabloid form. The first page illustration is a graphic display of "Brick a Barrier to Flame," affording an ocular demonstration that "with brick on guard many a community is fire-safe. A brick wall has many times turned flames aside or prevented the spread of a serious fire." Of course, the major part of the magazine is devoted to "Built Right, Run Right" machinery, but interspersed with the shop talk are many clever sayings. For instance, the following:

Three Cheers.

Now then, all together, three cheers.
Cheer One—Build with Brick.
Cheer Two—Pave with Brick.
Cheer Three—Tile Your Farm.
For these are cheers that last for years.

A copy of the magazine will be mailed to any address on request to the American Clay Machinery Company, Bucyrus, Ohio. See ads. on pages 365 to 368.

BONE DRY BEVERAGES.

The undertakers are working overtime in Colorado since the "Violet Cocktail" became popular. The "Violet" is composed of Jamaica ginger, sugar and water.

The "Delirium Fizz" is all the rage in Maine. It is made from diluted wood alcohol, powdered sugar and vanilla extract.

Out in Kansas the "Aurora Borealis" is making a big hit. It is made from bay rum and seltzer.

Nebraska prefers the "Whang Whizzer." It is a mild concoction made from witch hazel and sweet spirits of nitre.

Virginia is getting along temporarily on the "Snake Developer." This is composed of peppermint, liniment and molasses.—Luke McLuke, in Cincinnati Enquirer.

Party having been out of fire brick business for several years would be interested in fair-sized plant, preferably in East, either control or outright. Address
NEW JERSEY,
Care Clay-Worker.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.,

required by the act of Congress of August 24, 1912, of THE CLAY-WORKER, published monthly at Indianapolis, Ind., for October 1, 1917.

State of Indiana, County of Marion, ss:

Before me, a notary public in and for the state and county aforesaid, personally appeared T. A. Randall, who, having been duly sworn according to law, deposes and says that he is the managing editor of The Clay-Worker, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, T. A. Randall & Co., Inc., Indianapolis, Ind.
Editor, Theodore A. Randall, Indianapolis, Ind.
Managing Editor, Theo A. Randall, Idnianapolis, Ind.
Business manager, Theodore A. Randall, Indianapolis, Ind.

Owners are T. A. Randall & Co., Inc., Indianapolis, Ind.; Theodore A. Randall, James E. Randall and Denton F. Billingsley, each and all of whom are at 211 Hudson St., Indianapolis, Ind.

Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: None.

That the two paragraphs next above, giving the names of the owners, stockholders, security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

(Signed) Theo. A. Randall, Editor.

Sworn to and subscribed before me this 24th day of September, 1917. (Signed) CHRISTA A. LEWIS, Notary Public.
[Seal] My commission expires June 20, 1921.

EDITORIAL NOTES AND CLIPPINGS.

The Great Falls Brick & Tile Company, at Butte, Mont., will begin work on a $25,000 addition to the plant in the very near future.

The Capital Clay Company, Des Moines, Iowa, is increasing its capacity by the addition of a second Freese hollow-ware machine.

Charles C. Kreischer, of the firm of B. Kreischer & Sons, with brick factory at Kreischersville, S. I., died at his home in New York, the latter part of September.

Ad. Krug, civil engineer, of Haipsburg, Indo-China (via San Francisco and Hong Kong), writes that he desires catalogues of brick and tile machinery, kilns and steam engines.

The Harbison-Walker Refractories Company has just placed in operation the new fire brick equipment at their Harwalk plant, consisting of a Freese machine and automatic cutter, and American repress.

The Volz Fire Clay Co. has been organized, with headquarters at Page and Walton avenues, St. Louis, Mo. Edward R. Gittens is president; Ben Volz, vice president, and Samuel J. Gittens, manager. The company will develop 127 acres of fire clay land.

The Camp Conduit Company, Cleveland, Ohio, which recently acquired the former Eggers property, has just started the manufacture of hollow-ware on this plant. The equipment installed is a duplicate of the Freese outfit in operation on their original plant.

The Lake Shore Shale Brick Company, of Ashtabula, Ohio, has recently purchased a steam shovel for use in the shale pit. Business continues good with the company; especially is the demand good for their "rock face" brick. The company will drill for natural gas.

The Ferris Brick Company of Columbus, Ohio, has purchased the brickmaking plant of William Redett at Millersburg, Pa. The transaction also included some three hundred acres of land containing valuable clay and coal mines. The new owners will manufacture a high grade fire brick.

The American Clay Machinery Company, Bucyrus, Ohio, in addition to being busy with orders for clayworking machinery and supplies, recently booked an immense Government order for shells for the Navy Department. The company now has under contemplation the building of a new steel foundry.

A brickmaking plant is being installed at the Oklahoma State Penitentiary at McAlester. J. H. Needham, who has charge of the construction work, says the plant will be one of the most complete of the kind in the state. It is not expected to put the brick on the market, but to use the same for the erection of various state institutions.

The Brown Instrument Company, Philadelphia, advise us that they have had such an unusual demand for pyrometers and other scientific instruments which they manufacture that it has been found necessary to purchase a large piece of ground adjoining their present property. This will permit large extensions to their plant, as may be required from time to time.

Engineers have laid off the ground and other preparations have been made for the erection of an addition to the Municipal Shale Brick and Block Company's plant at Martinsburg, W. Va., and also for the erection of an additional plant on the Butler tract opposite the present plant. Besides building brick and hollow block, the company proposes to manufacture all kinds of fireproof earthen materials and glazed porcelain ware for electrical insulation purposes.

The Sugar Creek (Ohio) Clay Products Company is increasing capacity by the installation of a new Freese Model GC machine.

The Blue Ridge Clay Products Company of Wilmington, Dela., has been incorporated with $250,000 by M. L. Gatchel, M. L. Rogers and Harry W. Davis.

The Woodburn Tile & Brick Company at Woodburn, Ind., was almost totally destroyed by fire October 4, which started in the machinery room. The loss is estimated at $12,000.

Francisco Borges, Ciego de Avilla, Cuba, advises us that he is seeking information relative to the manufacture of brick and tile, as he anticipates erecting a plant for the manufacture of same.

The Charles V. Hoffman Company, 95 Liberty street, New York, N. Y., advises us that they are interested in clay products for refractory purposes and would like to get in touch with a number of clay miners.

H. F. Goss, of Casper, Wyo., writes that he expects to erect a brick plant at that place and would like to get in touch with brick machinery manufacturers. He was formerly associated with the F. H. Goss Brick Company, Tacoma, Wash.

C. B. Platt writes that he has succeeded Mr. Matt King as secretary of the Permanent Building Society, with headquarters at Des Moines, Iowa. Mr. King has answered his country's call and is now serving with the army at Fort Sill, with the rank of captain.

Mr. J. B. Phillips, vice president of the new Cannon-Phillipps Company, Sacramento, Cal., has just returned from a trip of inspection through the East and Canada. Among other additions to their equipment purchased during the trip is a Freese automatic cutter.

Warren Griffiss, general manager of the Baltimore Brick Company, Baltimore, Md., was painfully injured when his automobile collided with another. Mr. Griffiss' car was turned completely around and he received a number of serious bruises, being confined to his home for several days.

The American Pulverizer Company announces that they have moved their general and sales office, factory and new experimental station from East St. Louis to Eighteenth and Austin streets, St. Louis, Mo., within a five minutes walk of the Union Station, where they will be better equipped than ever to take care of their trade.

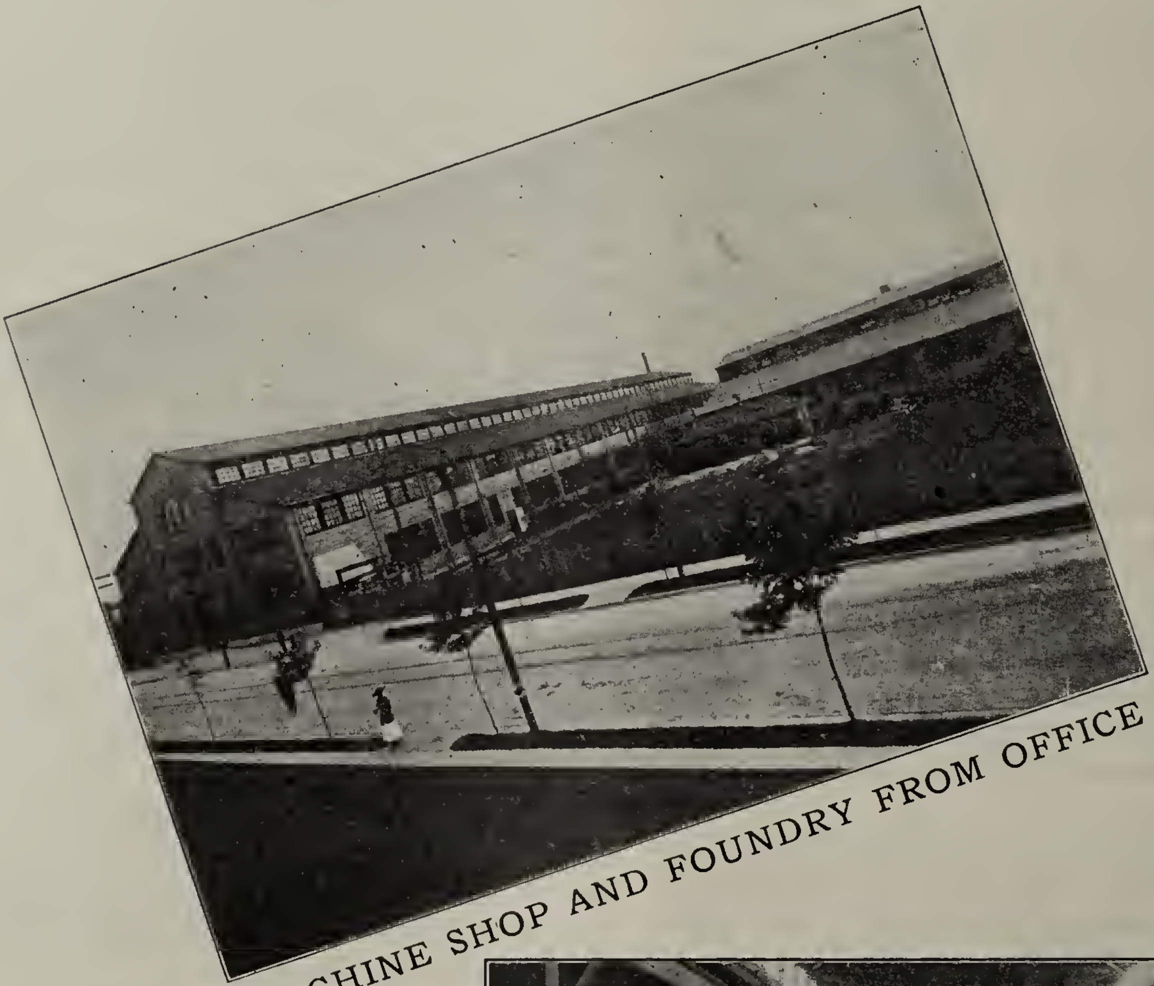
Greater Iowa Week was celebrated in Mason City, Iowa, the first week in October, the business men and merchants vying with each other in the extent and nature of displays made. According to the Mason City Times, some of the most striking exhibits were made by The American Brick & Tile Co., and the North Iowa Brick & Tile Co., and the Mason City Brick & Tile Company. The up-to-date brick man never loses an opportunity of bringing his product to the notice of the building public.

The Table Rock Brick & Material Company, of Table Rock, Neb., which has been closed down for a number of years, started operations last month. A new company has been organized with the following officers: F. A. Stech, president; W. C. Fellers, vice president; F. E. Schaff, vice president; E. E. Hanel, secretary; J. N. Phillips, treasurer. R. W. Besley, formerly manager of the sales department of the Hydraulic Hytex Press Brick Company, of Omaha, is the manager, and J. W. Tomek, of Table Rock, assistant manager of the plant.

The Belleville Brick & Tile Company, Belleville, Ill., announce that Mr. Anthony Ittner took charge of their St. Louis sales and deliveries, beginning September 1. Mr. Ittner has opened an office in the Chemical Building at Eighth and Olive streets. As most clayworkers know, Mr. Ittner is the veteran

(Continued on page 372.)

THE HOME OF "INTER



MACHINE SHOP AND FOUNDRY FROM OFFICE

INTERIOR OF MACHINE SHOP, LOOKING SOUTH

Who is better equip

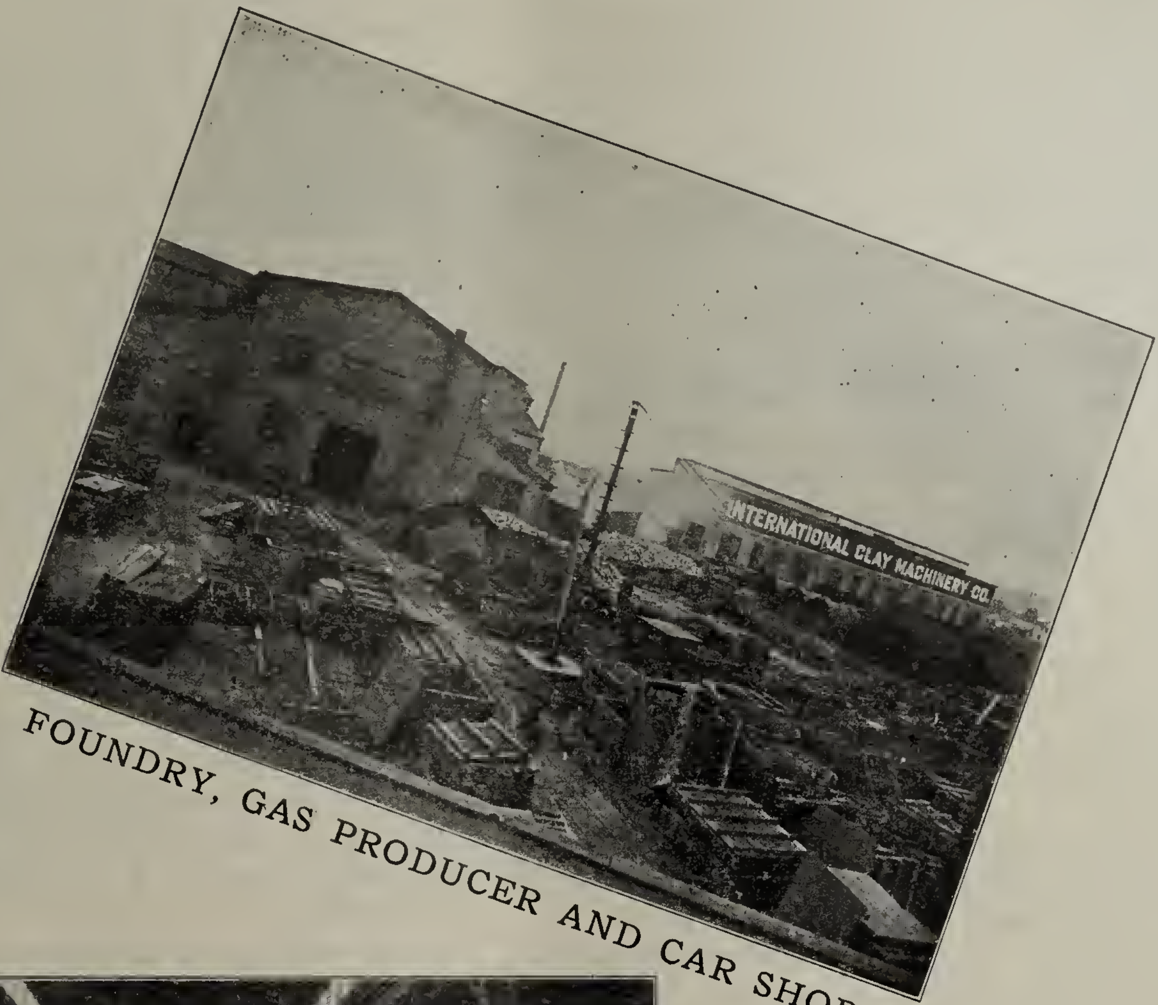
WRITE

INTERNATIONAL CLAY

DAYTON,

Mention The Clay-Worker.

NATIONAL SERVICE"



FOUNDRY, GAS PRODUCER AND CAR SHOPS

INTERIOR OF MACHINE SHOP, LOOKING NORTH

ped to serve you?

TODAY

MACHINERY COMPANY

OHIO, U.S.A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

brickmaker of St. Louis, and is probably one of the oldest active clayworkers in the country. Mr. Benjamin Ittner, the former St. Louis manager of the company, resigned to take a position with the Selden-Breck Construction Company, at Fort Sill, Okla.

The Lamberton (Pa.) plant of the Maddock Pottery Company of Trenton, N. J., suffered a loss of $5,000 by fire which is supposed to have been of incendiary origin. This is the fourth fire this company has had since last July, and runs the total loss up to $20,000.

The new $100,000.00 capacity plant of The Wadsworth (Ohio) Brick & Tile Company is now nearly completed and will soon commence operations. It is equipped with Freese Model KB machine, T60 cutter and P16 pug mill, Rodgers waste heat dryer and Plymouth locomotives.

The Standard Brick Company at Cleveland, Ohio, sustained a loss of several thousand dollars by fire which started in the engine room, September 27. A very high wind was blowing at the time and for a while it was feared the flames would spread to residences in the immediate vicinity of the plant.

The Brick Masons and Tile Makers Union of Toledo, Ohio recently presented one of the city parks with a very beautiful American flag, which is a little different from the general run of flags, in that it was made of brick and colored tile. "Old Glory" in burned clay is now one of the chief attractions at the park.

Southern brick manufacturers with offices at new Orleans, La., report that they are working their plants full blast to be able to take care of the growing demand for their product. The greater part of the brick demand now comes from the interior rural districts, where architects and contractors say building operations are due to soon show a very appreciable increase, according to the Southern press.

Harold S. Maddock vice-president of the Thomas Maddock Sons' Company, manufacturing potters, together with twelve of the employes of the company is a member of the National Army. A farewell reception was given by the employes of the pottery to the soldier boys, when each one was given a wrist watch and a comfort kit. Mr. Maddock expects to march side by side with the other recruits from the pottery.

Interstate Clay Products Co., White Bldg., Seattle, Wash., has recently added another Seattle factory to its chain of plants in the Northwest, the Lohse Brick Company. This makes six plants manufacturing Denison Tile, the other plants being: Harper-Hill Brick Co., Seattle; Far West Clay Co., Tacoma; Columbia Brick Works, Portland; Fairmount Brick & Tile Co., Eugene, Ore., and Port Haney Brick Co., Vancouver, B. C.

The brickmaking industry which thrived at St. Clair, Mich. some years before the closing down of the Belknap-Phillips yards, has been revived by the St. Clair Brick Company. The officers of the company are: President, Frank McElroy; Vice-President, F. H. Woodbridge; Secretary-Treasurer, D. C. McElroy; Manager, W. G. Crimmon. These officers with Frank Moore constitute the board of directors. The company now has an up-to-date plant.

After doing everything in his power to have the last Missouri legislature adopt a workman's compensation law for that state, A. P. Green, of the A. P. Green Brick Co., of Mexico, Mo., has voluntarily placed such a law in effect in his two plants. The law he is using is fashioned from that of both Illinois and Ohio and is one of the fairest said to have been made at this time. When an employe of the plant is injured, regardless of whether the accident was his own fault or due to negligence on the part of the company, he automatically becomes a beneficiary under the plant ruling. The first week of his time away from work he bears his own expenses, but after that he receives 60 per cent. of his wages until he is well.

The plant of the Poudre Valley Pressed Brick Company at Fort Collins, Colo., which has been in process of rebuilding was started October 1.

The Arkansas Brick & Tile Company, of Pine Bluff, Ark., have under consideration improvements to their plant which will cost about $15,000.

The McDonald Coal & Brick Company of Detroit, Mich., report that business is rushing with them. In fact, it is way ahead of that done last year.

The Abingdon Clay Company, Abingdon, Ill., and the Lacon Clay Products Company, Lacon, Ill., have placed their orders for new Freese Union machines.

The Virginia Potteries Co., will build a plant at Huntington, W. Va., for the manufacture of porcelain insulators. C. V. Rhodes is manager of the company.

Big building operations are looked for in South and Southwest Louisiana after the sugar and rice crops have been harvested, which will be about the first of the new year.

The Ceramic Products Co. has been chartered at Newark, N. J., with $25,000 capital to manufacture and ship ceramic products by Ira A. Call, Harry A. Pike and J. G. Turnbull.

The Atlantic Manganese Co., of McCormick, S. C., has been organized with Edward O'Brien as president. The capital stock of the company is given as $50,000, and they will develop a tract containing over fifty acres.

The Southern Ball Clay Company has been organized at Wilmington, Dela., to mine for clay, coal, gravel, etc. R. D. Buck, M. L. Horty, K. E. Longfield, all of Wilmington, are the incorporators. The company is capitalized at $600,000.

This will mean a large additional sum to be paid out and is the third increase in wages granted the employes of these fire brick plants. However, the business is booming, with increased prices for brick and the directors of the plants are giving the employes a share of the increased revenues.

Pursuant to an agreement reached by the managers of the Harbison-Walker and General Refractories Companies of Pittsburg, Pa., all the employes at their firebrick plants in Western Pennsylvania, and elsewhere have been given a wage increase of 25 cents a day or $1.50 a week. This increase became effective October 1.

A deal was closed recently between the Ohio State Brick and Stone Company of Columbus, Ohio, and The New Lexington Clay Manufacturing Company of New Lexington, whereby the former becomes the owner of the brick plant at New Lexington. The plant will be shut down until the new company can make the necessary changes and install whatever new machinery that will be needed. The Ohio State Brick and Stone Company will manufacture fire brick on an extensive scale. They are now operating a plant at Shawnee. The sum of $400,000 was paid for the property of the New Lexington Company.

Hiram Swank's Sons, Incorporated, of Johnstown, Pa., have purchased the plant of the Clymer Brick & Fire Clay Company at Indiana, Pa. The purchase price is supposed to have been something like $150,000. Hiram Swank's Sons, Inc., is regarded as a successful and enterprising corporation and with the acquisition of the Clymer concern, they broaden their scope of activity and plan vast extensions. At present the corporation has two similar plants: one at Johnstown, where 275 men are employed, and the other at Irvona, Clearfield County, where employment is given to 400 men. The owners plan, within the next two years, to triple the capacity of the Clymer plant. With the holdings in Johnstown, Irvona and Clymer it is expected that at the end of the initial period the combined brick capacity will be 65,000,000 a year. The Clymer operation will be turned into a fire brick plant exclusively, the present sidelines being discontinued.

Frederick Street, Baltimore, Md. Granite Block Pavement filled with Barrett's Paving Pitch.

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Roanoke, Va.

Written for The Clay-Worker.

PACIFIC COAST NEWS.

WHILE NONE OF THE clay products manufacturing concerns on the Pacific coast have yet deliberately curtailed manufacturing, still there is beginning to be apparent a slackening in the market demands. The labor troubles in various trades contribute to a general uncertainty, and it is known that much important building has been postponed on this account. The shortage of cars, the scarcity of brickyard laborers, the high cost of materials and the lack of practically all speculative building make the situation none too bright. Industrial building is going on as fast as circumstances permit, and there is plenty of government work and not a few large warehouses being put up. Less than the average number of apartment houses and private residences are being built. In view of the fact that savings bank deposits are on the increase it may be predicted with safety that the building of small houses will commence with a rush once the cost of materials becomes normal again. It is not the cost of clay products, however, which prohibits building, but the cost of steel and wood products chiefly. Clay products on the Pacific coast are very little higher than before the war, despite the greater cost of production, due to higher wages being paid, and the greater cost of handling and raw materials.

Common brick is still selling for $10.00 in the San Francisco district, as has been the case for many months, and no raise in price is under contemplation. The price of vitrified sewer pipe has advanced about 5 per cent. in the past summer, and there have been advances of small consequence in terra cotta products. Fire brick has kept abreast of the increased manufacturing costs somewhat better than other clay products and general business in fire brick is lively. The fire brick plants are all behind on orders and can't seem to get enough efficient workers.

The volume of sewer pipe business for the season has been fair, but hardly up to normal, by reason of the reluctance of municipalities to go ahead with sanitary engineering projects during war time. The government work has been a great help and probably will continue to bolster up the market for some time to come. The general demand on terra cotta products is steady, but nothing to boast of. In San Francisco there are several new business blocks which are using terra cotta trim, and throughout the State a number of new schools decorated with terra cotta have been completed in time for the opening of the school season. In the absence of any special propaganda work it must be admitted that the total volume of clay products business for the summer has been reasonably good. There has been so much rush work, and consequently cheap construction, on account of war demands, that it is no wonder high-class building materials have not been given their full share of patronage.

The largest order for clay products given by the U. S. Government to California manufacturers since the war began is that which was given this month for forty carloads of vitrified sewer pipe to be used in constructing a sanitary sewer system for Camp Fremont, at Menlo Park. The specifications call for 18-inch pipe and under. The quantity of pipe purchased is being supplied by various California concerns collectively. They are: Gladding, McBean & Co., the California Potter Company, N. Clark & Sons, Steiger Terra Cotta and Pottery Company and the Pacific Coast Pottery Company. All except the last, which is located in San Jose, are San Francisco Bay concerns. It is not announced what the government will use Camp Fremont for, but there is a report that it will be a training place for regulars. The supposition that this would be a concentration camp for drafted men has proven erroneous. Already there has been a hospital erected on the grounds.

A contract to supply the vitrified sewer pipe for a sanitary sewer system at Corcoran, Cal., has been awarded to Gladding, McBean & Co., of San Francisco.

The Stockton Fire and Enamel Brick Company are planning to erect two new kilns at their Stockton plant in the near future. These will be used in the manufacture of magnesite brick on a large scale. Experiments in magnesite brickmaking carried on in the past year have proven so successful that the company is convinced that their production can be profitably undertaken by the first of the new year. California magnesite from recently developed mines will be used if it can be obtained regularly. The California magnesite industry is thriving to such an extent that the entire output is sold months in advance, mostly to the East. Mr. Roberts, general manager of the Stockton Fire and Enamel Brick Co., says he is unable to make deliveries at present except from thirty to sixty days. He also has difficulty in hiring men of the right sort, notwithstanding the increased wage schedules in force.

W. S. Dickey, president of the W. S. Dickey Clay Manufacturing Co. of Kansas City, has just been on a visit to San Francisco, and the plant of the California Brick Co., at Decoto, Cal., in which he is financially interested.

The plant of Gladding, McBean & Co., at Lincoln, Placer county, California, was visited by the delegates of the Northern California Editorial Association, which held its semi-annual convention at Roseville early in the month. The newspaper men were shown the vast deposits of pottery clay on the premises and conducted through the pottery. The plant requires the services of from four to seven hundred men, according to the market demands and the season.

It is expected that within a few days the construction will be completed on the mills of the Piedra Magnesite Co., near Fresno. The buildings and equipment represent an investment of about $55,000. The company has bought fourteen magnesite claims from M. F. Tarpey, and it is estimated that about 1,800 tons of crudes will be produced every month and shipped to eastern mills. The company is controlled by J. T. Curran, J. W. Thomas and W. B. Phillips, of Porterville. The general offices of the concern are located in Porterville and are in charge of J. W. Thomas, the treasurer of the corporation. W. B. Phillips is the superintendent of the plant. Plans and estimates are now being worked out for a grinding mill. This will cost $12,000 and will be used in the production of plastic materials.

The Allied Union Pressed Brick Company has closed a five-year contract with the Richmond division of the Western States Gas and Electric Co., covering 100 horsepower in motors.

According to A. S. Cunningham, who is promoting the California Clay Corporation, the company succeeded in placing about one-fourth of its authorized issue of stock when the war was declared. The subsequent diversion of California capital into the purchasing of Liberty Bonds has retarded many legitimate industrial projects in the state, but Mr. Cunningham is now practically assured that he will be able to carry his proposition to a successful issue in spite of the handicaps due to war time.

The Steiger Terra Cotta and Pottery Co., whose plant was destroyed by fire some months ago, and which will not be rebuilt, largely by reason of the prohibitive cost of clayworking machinery at this time, has still a large stock of terra cotta products on hand and this will keep the company in the field for an indefinite period.

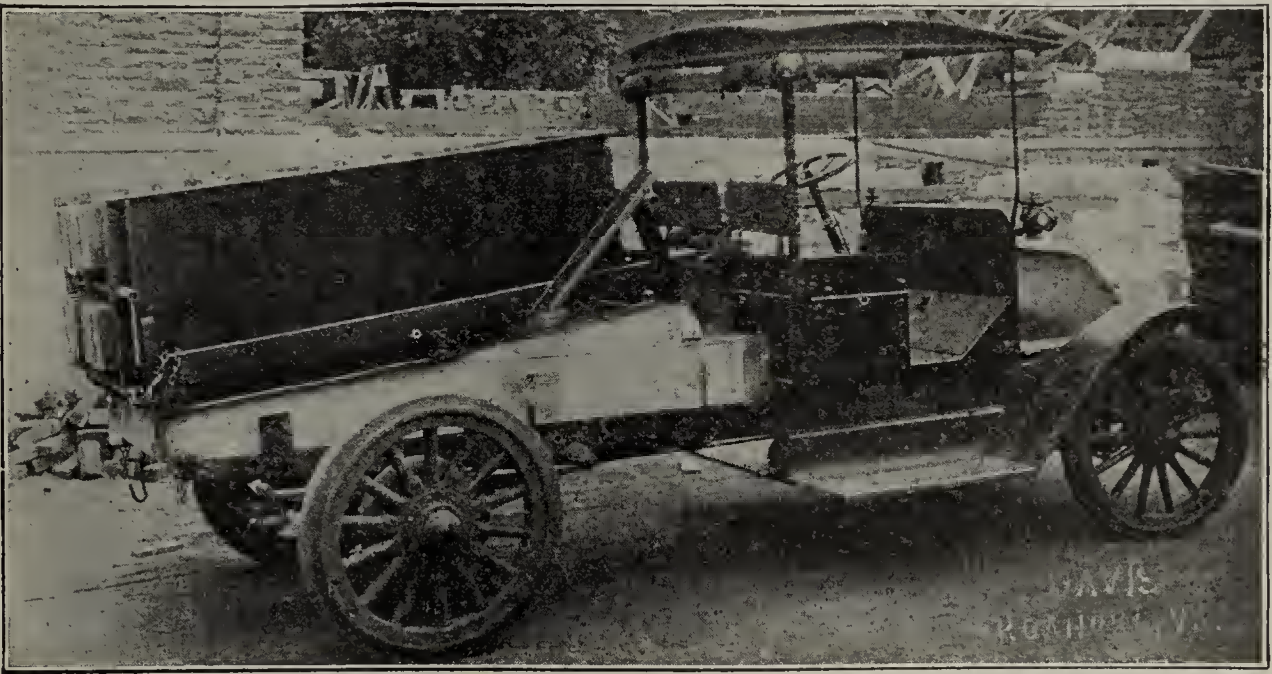
The Ancho Brick Company, of Ancho, N. M., has announced that in the future it will confine its operations to the manufacture of fire brick exclusively. The ovens are being refitted with this end in view. The clay at Ancho is claimed to be exceptionally well adapted for fire brick.

The brick and terra cotta work in connection with the yard work of the northeasterly wing of the San Francisco Hospital has been awarded to Emil Hogberg, of San Francisco.

The terra cotta plant of N. Clark & Sons, at Alameda, is operating steadily, but the entire sewer pipe plant is out of commission on account of the recent fire. The company is cleaned out of all sizes of vitrified pipe except 24-inch, the last of the other stock going to supply the company's quota in the Camp Fremont contract.

SUNSET.

San Francisco, Cal., Oct. 6.



INTERNATIONAL
for the
CLAYWORKER

The August issue of The Clay-Worker featured in its first article the thoroughly modern and efficient method of handling brick in bulk, by the use of motor truck and special body. Because of the scarcity of labor and other unusual conditions, this met with special attention on the part of the building trades.

In the five illustrations accompanying the article, the truck shown is the International Model F one-ton truck. Clayworkers will profit by more knowledge concerning the line of **International Motor Trucks.**

International Motor Trucks are now made as follows: 1,500, 2,000, 3,000 and 4,000 lbs. capacity, at $1,450 to $2,550 for the chassis (f. o. b. factory). For ten years International sales have steadily grown, building a reputation as high-quality, absolutely reliable trucks.

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BURNING CLAY WARES.

(Continued from page 329.)

widely variable. It increases with the complexity of the kiln bottom, with the distance of the stack from the kiln and with the closeness of the set ware. A kiln set with bricks will offer more resistance than one set with sewer pipe or other hollow ware. Kilns are frequently built with stacks in the kiln wall projecting above the heel of the crown and the gases in such stacks not only have a maximum initial temperature but this temperature is maintained by heat conducted from the kiln through the thin wall separating the stack. The draft intensity of such a stack will be very high. Next will come stacks just outside the kiln wall, then those ten to twenty feet away, and finally those several hundred feet away.

Evidently the problem of a proper kiln stack is not a simple one. In fact, a solution of it is not possible, but we should at least proportion the stack for conditions which are known or which can be determined, and thus leave less to guess work.

This is the purpose of this presentation.

Intensity of Draft.

The intensity of draft of a stack is the power, or suction, or pull, or static pressure, as one may prefer to call it.

Part of the intensity is required in the stack to move the weight of the gases and overcome friction of the gases against the stack walls, and deducting these from the total intensity we get the intensity which is available to force the gases through the kiln passages,—in other words, to overcome kiln resistance.

The intensity is the difference in weight of the stack column of hot gases and an equal column of cold air. The expansion of the hot gases creates a partial vacuum in the stack and the outside air presses in to overcome this vacuum. It is an unbalanced condition,—the light weight hot gases on one arm and the heavier cold air on the other. If we had a stack alone the total intensity would be used up by the stack resistance. The velocity of the gases in the stack would increase until the power required to move the weight of the gases and overcome the friction would equal the total power of the stack which in this case would be the available power. If we connect the stack with a kiln, the velocity of the gases in the stack will decrease and the stack power requirement for any given condition is five feet, leaving 35 the total stack power available to force air into the kiln and move the gases through the kiln.

To illustrate, suppose we have a stack intensity of 40 feet of air (stack intensity is indicated in feet of cold air, in ounces pressure, or in inches of water), and that the stack requirement for any given condition is five feet, leaving 35 feet for the kiln.

Let us assume that ten feet of this is required to force the air through the furnaces, fifteen feet to move the gases down through the ware, five feet to force them through the kiln floor, and five feet to carry them through the under floor flues to the stack base. This brings the gases to the stack without any force behind them except that required for the stack and the stack picks them up with the force reserved for it and carries them to the top of the stack. The cycle is complete and there is a perfect balance. If we should open up the grates, or in any way reduce the resistance in the kiln, the gases would arrive at the base of the stack with some available force behind them and this force, added to the force which the stack sequesters for itself, would tend to increase the velocity of the gases up the stack until this excess force is used up partly by increased stack resistance and partly by increased kiln resistance in consequence of greater velocity through the kiln.

If the kiln becomes choked we must rob the stack of some of its essential power to overcome the increased kiln resistance, which lessens the velocity in the stack, consequently through the kiln, thus reducing the kiln resistance. The power taken from the stack is available to overcome the net kiln resistance.

Suppose we have a hole, or crack through the kiln at the base of the kiln above the kiln floor. We have at the entrance to this hole the same pressure as we have under the grate bars while the work ahead of it to the base of the stack is only ten, whereas the work ahead of the air entering the grates is thirty-five. If the hole is large enough all of the air will short-cut through it to the base of the stack and the velocity will adjust itself to the total stack power, eliminating the upper part of the kiln entirely. (Note: In some yards the draft is controlled by a large opening in the main draft flue near the stack instead of by slide dampers. The opening uncovered cuts out the kiln entirely, but partially uncovered it merely checks the draft through the kiln. Such an opening serves an excellent purpose in cooling the kiln by updraft back through the kiln).

If the hole in the base of the kiln is merely a crack, the sides of which offer considerable resistance to the passage of the air, then the air will rush through this crack until a velocity which gives a resistance approximating 25 is attained, and the operation will then be in perfect balance, part of the air going through the crack and part through the kiln.

The pressure within a kiln system is always less than the atmospheric pressure, and one may ask why it is that gases will escape through a hole in the crown, under less pressure inside the crown than the air pressure outside the crown. The explanation is simple.

The kiln itself acts as a stack whenever a hole is opened in the crown, and its power will move the gases up through the hole in the crown unless the main kiln stack has sufficient power to overcome the intensity of the kiln acting as a stack in addition to the kiln resistance. It matters not whether the passage from the air entrance to the hole in the crown is a direct one which may be likened to a stack, or whether it is through a series of compartments as in a continuous kiln, so long as the exit in the crown is higher than the entrance level of the air.

This brings up the question of the value of a draft gage which C. B. Harrop so ably discussed before the American Ceramic Society. Suppose we have an ordinary inclined tube draft gage in the crown of a continuous kiln, let us say a chamber just connected, and which would be cold. Considered as a kiln stack, because the chamber is cold, the intensity will be slight and is easily overcome by the main kiln draft. The gage will, therefore, register a strong suction.

As the combustion approaches this compartment, the temperature advances, and the local upward intensity in the compartment increases, is less overcome by the main draft, and the suction shown in the draft gage decreases.

At the maximum temperature, and consequently the maximum upward tendency in the compartment, the draft suction shown by the gage may fall to zero and indeed frequently passes beyond the zero mark, and the gage registers an outward pressure instead of a suction. The main kiln draft during this period is constant while the draft gage shows a regular decrease and one must conclude that as an indicator of draft conditions, the draft gage as ordinarily used is of no value.

Area of Stack.

After a brick burning kiln has reached a dull red heat on top,—900 to 1200 degrees,—the weight of coal fired per hour becomes fairly constant. If the stack is outside the kiln and receives no heat except that from the waste gases, the stack temperature will be, perhaps, 232 degrees. We may assume that 15 per cent. of the coal will be used in bringing the kiln up to this stage.

(To be continued.)

THE CLAY-WORKER

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NOTES ON THE CRUCIBLE SITUATION.

The Importance of the Clay and the Knowledge of Ceramics in Manufacture of Graphite Crucibles.

By A. V. Bleininger, Pittsburgh, Pa.

THE GRAPHITE crucible used in the melting of brass, steel and various alloys consist essentially of a mixture of graphite and clay, which is shaped, dried and fired to a moderate temperature usually at or below 950 degree C. The properties of the graphite which render it so valuable in connection with this use are its refractoriness which to a certain extent is imparted to the clay bond, its reducing effect, which prevents oxidation of the metal and its high thermal conductivity which makes possible rapid fusion of the charge. In addition the smoothness of surface which it imparts to the crucible permits the clean pouring of the metal.

The function of the clay is that of a bonding material which makes possible the shaping of the crucible and the cementing together of the graphite flakes, at the same time it covers the particles and thus protects them from oxidation. In order to be most effective in regard to this point it is necessary that the clay contracts and becomes dense at as low a temperature as is consistent with the required refractoriness.

The manufacture of graphite crucible consists in thoroughly grinding and blending the graphite and clay, tempering with water in a suitable mixing machine till the mass has assumed the proper plastic consistency, shaping the crucible by means of a pottery jolly, drying and finally burning them.

A. V. Bleininger, Bureau of Standards. Pittsburgh, Pa.

It might be well to consider somewhat in detail the two essential raw materials, the graphite and the clay. The modification of carbon known as graphite has been defined as that allotropic form which has a specific gravity of from 2.25 to 2.26. Certain chemical tests, such as that of Brodie, consisting in treating the graphite with fuming nitric acid and potassium chlorate have been employed to differentiate it from other forms of carbon, though with variable success. Arsem (Trans. Am. Electro-Chem. Soc., 1911.) states that lamp black heated to a high temperature in the electric furnace, possessing none of the characteristic properties of graphite yielded the yellow graphitic acid of Brodie's test, though the specific gravity was only 2.122. As to the real nature of graphite we are still in the dark. It is crystalline, rhombohedral and stable at the highest temperatures. Its great softness, flaky structure and feeble metallic luster are characteristic. Its specific heat varies in the natural and artificial varieties, and according to the purity of the materials. Values have been determined for Ceylon graphite from 0.174 to 0.2019 and for blast furnace graphite from 0.166 to 0.1970. The specific heat increases with temperature, having been found to be 0.467 at 977 degrees C. The coefficient of the thermal conductivity of graphite (gram calories through 1 cm.cube) is 0.0141 and hence five times that of burned clay. The linear coefficient of expansion is 0.00000786 at 40 degress C. The excellent electrical conductivity of graphite is well known but is not of interest in this connection.

Graphite occurs in nature in several forms, more or less admixed with impurities. It occurs in the older crystalline rocks, gneiss, schist, crystalline limestone, granite and sometimes in carbonaceous shales and slates. Though often occurring in small flakes throughout schist, as in Alabama, it is also found in vein-like deposits of considerable thickness. Of this character are the occurrences in the Laurentian rocks of New York and Canada, the graphitic gneisses of the Eastern Alps, the granulites of Ceylon and the granites in Irkutsk, Siberia. Massive graphite occurs also in the Sonora district, Mexico, at Borrowdale, Cumberland (England), Passau (Bavaria), Schwarzbach (Bohemia), in Portugal, and in the province of Minas Geras (Brazil). The Mexican graphite mines are considered the richest in the world. In point of quality for the manufacture of crucibles the Ceylon graphite is considered the best, and enormous quantities are exported from there to Europe and the United States. In this country the best known deposit occurs at Ticonderoga, N. Y., but a large number of occurrences are to be met with in a number of states, as in Alabama, California, Pennsylvania, Georgia, North Carolina, New Hampshire, Rhode Island, Montana and Virginia. Canada likewise possesses extensive graphite deposits. Large developments are under way at the present time in Alabama. In most American deposits the graphite occurs in small flakes interspersed in mica schist or similar rocks. The contest of graphite scarcely ever exceeds 8 per cent and it must be removed from the rocks by means of the usual methods of ore dressing. Of late oil filtration processes and electro static separation have been adopted successfully. As a rule the domestic graphite is not as massive as the Ceylon product consisting either of small flakes or on the other hand being more of a granular, amorphous character. The Ceylon graphits possesses to a marked degree a characteristic foliated structure combined with a low content of ash. Graphites differ widely in composition and considerable variation is even observed in the Ceylon material. The purest grade of Ceylon graphite has been found to contain 98.87 per cent. carbon, 0.90 per cent. volatile matter and 20.28 per cent ash. Frequently, however, shipments show a carbon content of 79.4 per cent. and 15.5 per cent. ash. In all graphites used for crucible the ash content is of considerable importance especially with reference to the amount of iron oxide present. If this constituent is too high it is apt to cause more rapid corrosion of the crucibles. Graphites have been examined in this laboratory which contain as high as 40 per cent. of ash and 10 per cent. of iron oxide. For the manufacture of graphite crucibles the Ceylon chip and flake graphite is undoubtedly the best since practically no other material equals it in regard to both the most desirable type and unfirmity of structure. There is no reason, however, why the Ceylon graphite cannot be used admixed with some domestic product; in fact, up to 15 per cent. of the latter and perhaps higher.

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*Read before the Institute of Metals, Sept. 25, 1917, at Boston. Published by permission of the Director, Bureau of Standards.

The purification of graphite, too high in ash content, by chemical means such as treatment with hot caustic soda solution followed by washing with diluted acid, or with acid alone has been carried on successfully in the preparation of graphite for the lead pencil industry, but apparently is too expensive for crucible graphite, and at the same time such treatment requires fine grinding, which is not desirable for the purpose under discussion. It is interesting to note, however, that it has been possible to produce practically an ash free product from graphite containing 11 per cent. of mineral matter. The content of iron oxide may be reduced very largely by exposing the graphite to a current of hot, dry chlorine gas.

The simplest test for the purity of graphite is undoubtedly the determination of its specific gravity, which should conform to the value already given. The determination of the ash content likewise is necessary in the valuation of shipments.

Artificially Prepared Graphite and Carbon.

Upon heating anthracite or coke to a high temperature in the electric furnace the carbon is converted into graphite. This transformation is practically complete and may result in as much as 99 per cent. graphite. Owing to the great demand of artificial graphite for electrodes, lubricating and other purposes, this material from the standpoint of cost is not available for crucible making. At the same time its structure is not as desirable as that of the natural graphite and its rate of oxidation under furnace conditions is appreciably greater. Graphite is formed also by aggregation from cooling metal as in the case of blast furnace iron. Large quantities of scale like graphite are thus produced, known as "Kish." The lamellae of this type of graphite are exceedingly thin and fragile and in incorporating a given weight of this material in clay much more clay and water is required than when natural graphite is employed. Blast furnace graphite as a rule contains a good deal of iron, which would make necessary purification by means of an acid treatment. This type of graphite oxidizes more readily than natural graphite and is also more readily absorbed by molten steel.

Bureau of Standards Urges

¶From a circular letter sent by the Pittsburgh laboratory to makers of glass pots, and others, we give the following extract:

¶In work conducted at this laboratory it has been found that the waste biscuit of white ware potteries is well adapted for use as "grog" for pots used in the melting of optical glass so urgently needed at the present time for range finders, gun sights, periscope lenses, etc. The low content of iron oxide in this material and its homogeneous structure render it superior to crushed pot shell or calcined clay for this specific purpose. A much smaller and limited amount of porcelain biscuit may also be used but it is very important to keep the different kinds of body sharply separated since porcelain table ware biscuit is distinct from electrical and sanitary porcelain. The porcelain can be used only in small quantities as a fluxing constituent while the typical white ware body is of a refractory nature. It is evident that glazed pottery waste cannot be used and that we are speaking here of unglazed material which, through some defect, cannot be fired in the glost burn.

¶Appeals to a number of large pottery man-

Sources of non-crystalline carbon are also coke, retort graphite formed in gas retorts, and the carbon resulting from the decomposition of hydrocarbons.

In European practice both coke and retort graphite have been admixed with the natural graphite for making crucibles. This practice is not desirable for steel melting, since the amorphous forms of carbon are more soluble in the molten metal than crystallized graphite and hence cause too much cementation. Their more rapid rate of oxidation is likewise detrimental for this purpose.

Some of the Birmingham crucibles are said to be made up of 3 parts (by weight) of graphite, 2 of hard coke, 2 of Stourbridge clay and 1 of ground sherds from old crucibles. Crucibles used in a German foundry have been made from a mixture consisting of 5 parts of ground coke, 4 of graphite and 8 parts of Stourbridge clay and grog. If the necessity arose it would be, of course, possible to use crucible in which all the carbon is introduced in the form of retort carbon, coke or electric furnace graphite, even though the results were not as satisfactory as those obtained with the natural graphite.

Bond Clays for Crucibles.

Up to the beginning of the present war the clay used almost exclusively as a bonding material for graphite crucibles was that from Klingenber, Bavaria. This clay is of a dark-bluish color and possesses marked plasticity and bonding power. When made up with water it is of "sticky" consistency and is capable of cementing together a large volume of non-plastic material such as graphite, to form, upon drying, a tough, strong body. It has been claimed by Scheid that the structure of the clay grains resemble that of fine mica, showing crystalline forms or fragments of such. This scaly structure, approaching that of graphite, is thus said to bring about a condition of strong cohesion between the two materials. At the same time the clay appear to be quite high in organic matter. Unmixed with non-plastic material it has a decided tendency to check and crack in drying. There are several grades of this clay which differ somewhat in their properties, and when marketed it does not possess the uniformity of composition which has been claimed for it. Some of the chemical analyses given for this clay are as follows:

	1 per cent.	2 per cent.	3 per cent.	4 per cent.	5 per cent.
Silica	50.76	49.00	54.06	56.62	47.49
Alumina	29.26	32.62	33.11	29.09	34 94
Ferric Oxide...	1.51	1.58	1.50	1.78	2.63
Titanium Oxide	1.61				
Lime......	1.08	0.52	0.49	0.73	1.04
Magnesia..	0.73		0.45		
Potash	0.85	0.73	1.37	0.79	1.13
Soda	0.19				
Loss on ignition	14.24		9.12	11.03	12.77

Use of Waste Pottery Biscuit

ufacturers have been answered with gratifying promptness which speaks well for their zeal for the common good. It is estimated that about 250 tons of waste white ware biscuit are available per month at the present time and at a very reasonable price.

¶The white ware biscuit is well suited also for use in the regular glass pot mixtures as an addition to pottery bodies, etc., but preference should be given to clay pots used in the melting of optical or signal glass. The most desirable white ware biscuit should have a softening point corresponding to Orton cone No. 30, or above.

¶In being employed for this purpose the biscuit is crushed in a jaw crusher or a dry pan, screened and then passed over a strong magnetic separator for the elimination of metallic iron.

¶The Pittsburgh laboratory is ready to give advice concerning the supply and use of this waste material to any one interested and is ready to make softening point determinations free of charge. Inquiries should be addressed to the Bureau of Standards, 40th and Butler Sts., Pittsburgh, Pa.

From an analysis of the Klingenberg clay made in this laboratory it appears that it is composed of about 80.64 per cent. of clay substance, 12.86 per cent. fine quartz and 6.50 per cent. of feldspar. In addition to its excellent plasticity and bonding power this clay possesses the property of burning to a dense structure at comparatively low temperature, about 1125 degrees C, thus enveloping and protecting the graphite from oxidation. Furthermore it is quite refactory, showing no giving way or decided softening at temperatures up to 1400 degrees C. When admixed with graphite its resistence to high temperatures is increased still more and it begins to soften only when the graphite is burned away in larger quantities. It is quite likely that at the maximum furnace temperatures silicon carbide is formed, due to the reaction between the silica of the clay and the graphite. The green patches sometimes observed on graphite crucibles would tend to indicate such a condition.

Testing of Bond Clay.

In the study of clays it soon becomes evident that the chemical composition plays but a minor role. It is impossible to foretell anything concerning the physical properties of a clay from its composition excepting the refractionariness, which can be estimated quite accurately. For this reason it is evident that tests of the physical properties are of far greater significance. It might be well to consider some of these together with simple tests devised for their numerical evaluation.

One of the first constants we desire to know about a clay is the amount of water required to impart to it the consistency known as normal consistency. By this we mean the condition in which the clay is neither too stiff so that it cannot be molded and shaped readily, nor too soft that it will deform by its own weight. It should not be so soft that the clay will stick to a bright nickel knife or spatula. The experienced operator will hit this condition with considerable accuracy, but unfortunately we have no device for gauging it with absolute accuracy. The Vicat needle used in cement testing has been suggested for this purpose. It is surprising, however, how closely an experienced operator can check his work in obtaining practically the same consistency. In determining the water content, then, we must make up a briquette of the plastic clay, weigh it at once and dry it. The final drying should take place at a temperature of 110 degrees C. The calculation involved is a very simple one and consists in subtracting the weight of the dried piece from its weight in the plastic state and dividing by the dry weight of the specimen. This result multiplied by 100 gives the percentage of water required by the clay, in terms of its dry weight. As a rule the higher the required water content of a clay is the more plastic the material, but if this value becomes too high the plasticity becomes stickiness which is

(Continued on page 474.)

OF INTEREST TO DRAIN TILE MANUFACTURERS

PLANT OF STREATOR DRAIN TILE CO.

THE LARGEST drain tile manufacturing concern in the State of Illinois is that of the Streator Drain Tile Co. This excellent company, which is doing its bit in furnishing large quantities of tile so necessary in the nation-wide movement for larger crop yields, has an enviable reputation for quality of product and clean business methods. The present plant, built in 1907, was formerly owned and operated by the National Drain Tile Co., which company sold out to the present owners in the early part of this year. The officers of the Streator Drain Tile Co., widely known, influential business men, are C. H. Williams, President; E. C. Kline, Vice-President; W. C. Jones, Treasurer; John T. Morris, Secretary and Manager, and James A. Reeves, Sales Manager.

This plant, which manufactures 4 to 30-inch drain tile, is located one mile southwest of Streator, on 60 acres of land containing rich deposits of clay and coal. The plant has every natural advantage. It is splendidly located, having excellent transportation facilities with Wabash loading tracks and direct connections with the C. & A., Santa Fe, New York Central, and two branches of the C., B. & Q.

The Clay Deposits.

There is an overburden of from two to ten feet underneath which is a stratum of shale varying from 25 to 35 feet in depth. Underlying the shale deposit is a four-foot vein of coal, superimposing a five-foot stratum of fire clay resting on a large formation of shale and fire clay. At the present time only the upper shale deposit is being worked. The overburden is stripped and the shale removed by means of a Lidgerwood Manufacturing Company drag line excavator. This has proved entirely satisfactory. Four men are employed in the pit, an engineer, a fireman, a track man and one for transfer. The overburden is tossed to one side and the shale dumped into two yard clay cars. A horse pulls the loaded cars a short distance to an incline, where the cars are conveyed to the plant by means of a winding drum and cable.

The Manufacture of Drain Tile.

One hundred and fifty tons of shale are delivered daily to the storage bin, from which it is fed into two American Clay

Views of the Office and Plant of the Streator Drain Tile Company, Streator, Ill.

The Drag Line Excavator in Operation.

Machine Room Where Smaller Size Tile Are Made.

Machinery Company dry pans. The ground shale is elevated to the third floor, where it passes through piano wire screens. The screened clay is then elevated to the fourth floor, where it enters an American pug mill. A feeder flying belt arrangement throws the pugged material as desired into a Taplin-Rice-Clerkin Company vertical press on the third floor. The press delivers on the second floor. Tile from 10 to 30 inches are made on this press.

The second floor drying space is filled with the larger size, as is also the first floor space. The tile are taken below by means of what is termed on the plant the "roller coaster" elevator. An inclined roller conveyor allows the pallet with its tile to glide slowly down to the elevator platform. A brake arrangement holds the platform in place until the tile is safely on the platform. The brake is then released and the elevator descends automatically, the weight of the tile taking it to the first floor level. Here the prongs of a truck are pushed under the pallet, and the tile moved to the desired place on that floor, while the elevator platform returns automatically to its place on the second floor in time to receive the next tile. The operation is performed in the time it takes to form a tile, and the "roller coaster" works with such clock-like precision that the work is carried on steadily without a hitch. This method saves time, trouble and labor, only one man being required to work the steam press and elevator, one man to get the tile to the elevator platform, and one or two men on the first dryer floor, according to the distance from the elevator to the drying place.

An H. Brewer & Co. tile machine is used on the third floor for the manufacture of 4 to 8-inch tile in one foot lengths. A belt arrangement in connection with the pug mill furnishes the pugged clay to this point also. The small tile are cut off automatically by a J. D. Fate Company automatic cut-off and are placed on spring platform trucks and trucked to the drying floors. There are three drying floors, each 80 by 224 feet, heated by steam, many thousand feet of piping being used. Gravity elevators are used in taking tile from one floor to another. It requires about three days to dry smaller sizes and five days for the larger tile.

When the tile have been properly dried they are set in the kilns, there being seventeen (33 foot inside diameter) heavily banded round down-draft kilns. The ware is burned in six days, the firing being done according to indications taken by trial pieces.

There is one brick stack to each of four kilns, the stacks being 36 inches square and each containing four chambers, one for each kiln. Conveniently located near the kilns is a depressed track, where a considerable number of cars can

A Corner of the Drying Floor Filled with 30-inch Tile.

Setting a Kiln of Drain Tile.

be loaded at one time. One hundred and fifty cars are loaded each month, any surplus tile being stocked on loading docks.

The power plant consists of a battery of four 100-horsepower high-pressure boilers, a 300-horsepower Hamilton-Corliss engine with a 1200-foot 1¼ manila rope drive transmission furnished by the Dodge Manufacturing Company.

The electric power is furnished by means of a General Electric generator, a Chandler & Taylor engine being used for the lighting. The plant was originally built for a 12-kiln factory, but the constantly increasing demand made the gradual kiln additions necessary.

The company ships to a large territory, covering Illinois and Wisconsin, and occasionally to Iowa and Minnesota.

Of unusual interest to the average visitor is the locker and wash rooms, installed in a convenient part of the factory for the men. The 75 to 100 men employed find considerable satisfaction in working for a concern offering such facilities and conveniences. The wash room is sanitary, well lighted and ventilated and in the winter time comfortably heated by pipes leading from the lower drying floor.

The office is built of brick, a large pyramid of drain tile decorating one corner of the building. The visitor can always expect a warm welcome from the congenial officers of the company, who handle their men and treat their customers in the same delightful manner. This and the quality of their ware are no doubt big factors in the successful operation of their business.

THE DRAINING QUESTION.

(Apologies to Shakespeare.)

To drain or not to drain, that is the question,
Whether 'tis profitable to my purse to suffer
The swamps and ditches to continue
Or to battle the excessive moisture
And thus by draining, end it. To drain, to tile;
No more our crops a failure; Thus we end
Our losses and the dire forebodings of our hearts.
Success is ours. This is a real condition
Devoutly to be wished. To tile, to drain;
To sow and then to reap; oh, there's the joy,
For in that reaping time what dreams are ours
And visions of great gains and happiness to come.
Thus fall we readily into profits gained.
Then tile your pastures, meadow lands and fields,
And with no niggard hand lay in a vast supply
Of well-made tiling, vitrified and ample.
Then sit you back and count up what earth yields
In times of each recurring harvest.

Kansas City, Mo. —M. R. ELLIS.

THE HAMMOND PLAN.

Those who are concerned in the matter of boosting building brick should find much of interest in a recent booklet issued by the International Harvester Co. from its agricultural extension department in Chicago, entitled the Hammond Plan.

The interest to the building brick fraternity arises from the fact that the Hammond Plan has to do with civic improvements and the up-building of the community on broader and better lines.

Any proposition to improve the city or community means in its final analysis not only better education and direction of mankind, but also home surroundings which in turn means the building of better homes, all of which leads finally to brick and other clay products.

Clay products constitute the greatest basic material for community building aside from humanity itself and members of the industry may well show a wider and deeper interest in the subject of community development and improvement as outlined in this Hammond plan because it makes for good business as well as human progress. As community building means using more clay products so there is material gain to the brick man as well as general progress for mankind and community improvement.

THE ARCHITECT AND THE SMALL HOUSE.

One of the ever-recurrent problems confronting the brick industry and the builders of smaller homes is that of the relation of the architect to these smaller undertakings. This problem butting in so frequently is probably one reason why the progress of brick in modest home building has been slower than it should.

In building with lumber, the architect hardly gets a look-in on these modest homes, except that he may get out books or what we might term standard plans that can be used repeatedly in different parts of the country and by different people. The lumber folks and the carpenter contractors have brought some architectural talent into their own part of this work and have developed many books of plans, and also the habit of making plans after rough sketches, so the builder of a small home out of lumber gives but little thought to architects or to paying any architectural fee.

Moreover, heretofore the builder of the smaller home has generally been more concerned with providing a habitation at the smallest cost than putting specific architectural beauty into it. Now, however, would-be home builders are feeling a desire for architectural beauty as well as for more permanence in building, and the result is a condition that no general solution has been offered for.

Architects look on, and some have fretted because in the aggregate the modest home builder represents a mighty big item in the building world, one in which he feels that he ought to have a more active hand, not only because of immediate material benefit, but also in the interest of architecture generally the country over.

Now a peculiar phase of the situation is in the fact that when the brick fraternity undertakes to follow in the footsteps of the lumber trade and employs some architectural help, and designs some standard types of homes, there is a more general feeling of resentment toward the brick men on the part of the architects than ever has been manifested toward the lumber men for doing the same thing. Architects are not prejudiced against lumber because lumber men have designed homes and gotten out books of plans, neither do they hesitate in specifying lumber. In this we might argue that they should take the same liberal attitude to brick.

Anyway, there is plainly a need here for some more work on the subject of architecture and the modest home. There should be some sort of common ground of co-operation between brick men and the architects in boosting brick building for the modest home so that the brick trade may have a fair quantity of plan books to arouse interest and create a building desire and have included in these enough of architectural beauty to make some real improvement in home designs. During the quiet season of the winter months is a splendid time for the brick men and the architects to talk this over and see what can be done.

Those who investigate the subject of labor and its compensations argue that every man who works all the time should be able to obtain therefor that which will provide the necessities of life. That looks simple enough until you undertake to define what constitutes the necessities of life and determine what they should cost.

BUTTON-HOLE TALKS.

The Wooing of Eve.

HAVING CAUGHT me, he went right to it—

"Adam was a busy man, at first, a lonesome man. He had much to do and he had no precedents to go by; had to go at it and study out just the best way to do things; had to, in fact, establish precedents for all men that followed him. He made no precedents for boys for Adam never was a boy, he arrived full grown. He missed all those boyish stages of awkwardness, of bashfulness, of boisterousness, of helplessness, of despising girls, of the period of taking notice, of showing off and then the final stage of utter helplessness and surrender to them. He made no precedents for women for there were no women until after the rib incident, and anyway he knew it wouldn't do any good, for they would make their own.

W. D. Gates.

"When he awoke from the sleep of the lost rib and caught sight of Eve, sitting there so demure and beautiful, he must have been at his wits end. He felt that he must win her but how should he go about it. Here was a precedent that he was to establish in which he must make no mistake for it was to be followed implicitly by all future generations. He had been very busy cataloging all those strange and grotesque animals in the menagerie that had been handed him and had pretty much exhausted himself in studying up names for them, keeping the mastodon from treading on the flea, trying to keep the duck from getting wet feet and keeping the mouse from tormenting the elephant. Eve looked different to him from all the animals. Was she dangerous? Adam didn't think she was. In this matter all his descendants have had the advantage of him in knowing that she was. It's lucky anyway that Adam didn't know how dangerous she was or he might have quit right there. He knew that he must win her, but how go about it? There was no one to introduce him. We all know how necessary this is and how very awkward a situation it occasions when there is no one to perform the ceremony. It never has made any particular difference who did it but there must be some one to say "Miss Eve, allow me to present Mr. Adam." There being no one to do this he was stopped before he had begun. All of us know right well what agonies we have suffered when some vision in femininity has dawned upon us, and, because there was no one to introduce us, we had to stand aside and see others bask in the adorable one's smiles while we looked on from afar. He must suddenly plunge into this matter of courting and winning the only woman in the world and must make no mistake or be doomed to bachelordom to a finality. He felt that they were made for each other as many have felt since his time. Whatever doubt there may be as to this in subsequent cases there is no question but it was an absolute fact in the case of Adam and Eve. Right here I am confident that he established a lasting precedent by telling her that "She was the only girl in the world and that he had never loved any one before." This precedent has been followed so diligently by every lover—honest or lying—since that it is clear that Adam established it and his every male descendant has followed it. When Adam told Eve this he told the truth and she believed him. Precedent again. Every lying lover since has told the same, and every trusting Eve since has believed him. There was no father to ask, no mother-in-law, no flat to rent, no installment furniture with a dollar down and a dollar as long as you live, no visiting relatives who might not attract him as she did, no lodge to lure him away at night and no woman's club to lure her away days. They were a mighty nice young couple and we owe them a lot. Suppose they had botched this business, where would we be? It's a mighty good thing for us that Adam was a winner and made precedents for mankind and that Eve bequeathed her beauty and winning ways to her daughters.

"The climax to the courtship is the trip to the preacher, This Adam and Eve could not do for there was no preacher. They were never married.."

Right here I stopped him off, and I stopped him quick. I wasn't going to sit still and hear my ancestors scandalized. That's the trouble with these genealogists just as soon as they begin hunting up your ancestors they begin hunting out annoying details and thus spoil the whole job. Far be it from me to sit still and listen to him casting aspersions on my direct ancestors in such an important detail as their marriage.

GATES.

Written for The Clay-Worker.

AMONG PHILADELPHIA BRICKMAKERS.

A BUSINESS, which involves clay products, in the Quaker City, is reported by all reputable concerns as exceptionally quiet. The official reports show that the approximate number of dwellings built annually in this city is from 5,000 to 6,000 and that up to date this year, only 1,500 have gone up. Naturally, this makes the brick business fall off along with the scarcity of labor and the absurdly high cost of material. There are a goodly number of factories and structures of absolute necessity going up and also three enormous shipbuilding plants in the vicinity of Philadelphia, directly on the Delaware river.

The Montgomery Shale Brick Co., inc., is about to install a kiln at Westpoint, Pa., which is capable of turning out from 25,000 to 50,000 common bricks per day. This company expects to operate exclusively on vitrified sewer brick. They are supplying the brick for the immense layout now under way for the Crewe-Levick Refining Co., on Pety's Island. It is to be a triple plant, part of it is to be used for the storage of coal by the Philadelphia Electric and Cramps' Shipbuilding Co., while the Crewe-Levick company will utilize it for storage, refining, etc.

John F. Brady, who handles all kinds of brick, is supplying the brick for the American International Shipbuilding Company, on Hog Island. Also for the U. S. Shipping Board and Trayler Engineering Co., at Cornwells, Bucks county, Pennsylvania. This concern just completed a big contract for Acid brick to be shipped to the Atlantic Refining Co., at Point Breeze, Philadelphia.

Mr. Brady recently closed a big deal for Fire brick and is shipping it to the Lehigh Valley Stone Co., at Allentown, Pa., also transporting a big shipment to the Allen Wood Iron and Steel Co., and the Tacony Ordnance Co., at Tacony, Pa.

The John F. Brady forces are also furnishing the Red Quarry Tile which is being used in the Building of the Kuebler Brewery, at Easton, Pa.

The Jarden Brick Co., one of some repute in the Quaker City, report that they have big municipal contracts in Chester, Pa., but that they are unable to fill them on account of the embargo.

William Conway, the veteran brickmaker of Philadelphia, is operating his plant to capacity and reports a fairly satisfactory season. His brick are burned in a continuous kiln, so he has not experienced difficulty in getting an adequate coal supply. He considers the building situation moderately good.

Chambers Brothers Company, well known manufacturers of brickmaking machinery, report an average season. They supplied considerable machinery to refractory plants during the summer and fall, their improved Keystone repress being especially adapted to the manufacture of furnace block and other fire brick.

A. QUAKER.

Mechanical Tamping Template which cuts the Concrete and Tamps it to Uniform Density and Smooth Surface.

Indiana Commissioners Witness Monolithic Brick Construction.

Wide Tires and Easily Portable, Without Disturbing the Brick Surface.

COUNTY commissioners of Indiana spent a very profitable three days on the occasion of their eleventh annual meeting at Indianapolis, September 25-27. One feature that gave an opportunity for observation and intensive study of modern road building was the construction of a monolithic brick pavement on South Meridian street.

Automobile trips to the scene of construction, two miles distant, did not interfere with the meetings and afforded a diversion from the routine of business.

The delegates were much interested in the precise and careful manner in which the pavement was built, in the way in which labor-saving machines ingeniously worked and in the excellence of construction attained.

There were a number of engineers in the inspection parties, and they expressed the belief that with the passing of generations the pavement will stand without appreciable damage from elements or the heaviest kind of traffic.

The construction of South Meridian road was a sight worth going many miles to see. Indeed a party of contractors came to see it from Des Moines, Iowa, where a similar pavement, twenty feet wide and five miles long, is to be built between Fort Dodge and Des Moines.

Witnessing the construction of South Meridian road was only an incidental feature of the county commissioners' program, but as they themselves expressed it, a very important part of it.

Whenever mechanical control can be secured in the construction of brick pavements by laying the brick in the green concrete, a decided advantage is gained.

The accompanying views illustrate the details of the method now in progress in building the brick pavement on South Meridian street, Indianapolis, Ind. Sixteen feet of brick on either side of the roadway is separated at the center by space left for the construction of street railway tracks. A concrete curb has been provided for the outside edges, but at the center, contiguous to the rails, no curbing was required. The work therefore represents a composite of city street and country road construction, in that the curb on the outside and

A Delegation of Indiana Commissioners Inspecting Monolithic Brick Pavement in Indianapolis.

steel side forms on the inside, furnish the support for the template and for retaining the green concrete until it has hardened. A longitudinal expansion cushion was laid along the curb, equal in depth to the combined depths of brick and concrete.

A noteworthy advantage was secured in the use of the mechanical tamping template. With power generated by a small six-horsepower gasoline motor, mounted in the center of the template, propulsion is secured by winding wire rope upon a drum, the ends of the rope being carried forward along either edge of the pavement and securely anchored. The rocker arm shown in Fig. 3 is simultaneously actuated, which raises and lowers the forward and rear I-beams which serve to cut off the concrete and uniformly compact and smooth it for receiving the brick. Additional smoothness is gained by the middle I-beam which is rigidly held in the frame work.

The series of photographs show the brick laying always within 25 feet of the concrete mixer, a point which has been overlooked in a great deal of monolithic construction.

Rolling the Brick. The Roller Weighs About 400 Pounds. Note the Smooth and Even Surface.

Sweeping and rolling immediately follow bricklaying, as seen in the illustrations and the pavement is then ready for grouting.

The type of mechanical mixer used on South Meridian street is clearly shown. Although not provided with a continuous supply of water by hose, accompanied by an automatic regulating device, the correct amount is brought in buckets for each batch of grout. A correct use of the mixer insures a thoroughly mixed grout, and one in which the hazard of separation in filling the joints is minimized, provided subsequent handling immediately works the filler into the joints.

The view opposite shows the strong and substantial pavement afforded by laying the brick on the green concrete foundation, and moreover gives evidence of the worth of the means used in building the work.

Mr. W. T. Blackburn, who had a prominent part in the development of methods for monolithic construction at Paris, Ill., says of the South Meridian street pavement:

"I was very much pleased with the work being done on South Meridian street. I anticipate that this section will give a very creditable account of itself after years of service."

Mr. Charles E. Chaney is county surveyor of Marion county and the South Meridian street pavement is of his design and direction. The Cunningham Construction Co., Martinsville, Indiana, are contractors. C. P. Lycan is superintending the work.—Dependable Highways.

GOOD ROAD DRAINAGE.

Many of our roads must of necessity be built across low spots or, in an endeavor to avoid a too close proximity to streams by following the edge of the bordering hills, must cross wet spots due to seepage from higher ground. While the experienced engineer will locate the road so that these places are avoided as much as possible, it often happens that to shorten the route, prevent a sharp curve, or a heavy, steep grade, he is forced to accept the challenge of draining these soft wet spots.

Ordinarily the construction of proper drainage ditches in wet, soggy ground is a very difficult matter. Horses, tractors, and machinery can seldom be used on account of getting mired in the mud, and hand labor is entirely too scarce and expensive to be used for such purposes.

One very successful road contractor uses large amounts of dynamite in general road work, and finds it of great assistance in ditching these wet spots. He uses the electrical method of firing, making the holes about six inches shallower than the grade line desired, and placing them about thirty inches apart along the center line of the proposed ditch. The charges of dynamite are primed with an electric blasting cap, placed in the holes, and well tamped. The electric cap wires are connected up in series and fired by a blasting machine. In this manner the entire line of charges explodes at the same instant, lifting the dirt high in the air and scattering it over the surrounding land, thus doing away with high banks of earth along the ditch.

He has become so successful at this kind of work that by proper loading there is no hand work to be done after the blast, as the ditch is left clean and clear of all debris, ready for immediate use.

A ditch averaging four feet deep and eight feet wide on top can be made in this manner without the aid of a shovel of any kind. From one to one and one-half pounds of 40 per cent. Low Freezing dynamite per hole is sufficient loading for this size of ditch in heavy soil.

The contractor claims that this method is most satisfactory from his standpoint, on account of economy, because of its quickness, and because of the saving in hand labor, which at this time of serious labor shortage is an all important item.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART XVIX—KILN STACKS—(Continued).

RED BURNING bricks will require from 200 to 600 pounds of average coal (12000 B. t. u.) per ton of bricks, and we will take an average of 400 pounds, less 60 pounds for the first heating up, which gives us 340 pounds per ton.

The time required to burn varies from five to ten days, and we will assume eight days and allow three days for the preliminary heating up. A 30-foot round down draft kiln will hold 230 tons of 6-pound standard sized bricks, provided the shrinkage is not excessive. One may figure fourteen bricks per cubic foot of setting space, or 720 pounds of ware per square foot of floor area. If a factory is in operation and wishes to increase the kiln capacity, all of the data necessary for the calculations can be obtained from the kilns in use and any faults in the kilns in use can be corrected in the new kilns.

If the plant is a new one, data from neighboring factories may be obtainable, but this lacking, one must depend upon tests of the materials and practical experience.

In the above example, we have 340 pounds of coal per hour during a period of five days, starting with a stack temperature of 232 degrees, to determine the proper stack.

We had from the coal calculation, including 50 per cent. excess air, 14.7 pounds of gas, which at 62 degrees will give us 179.4 cubic feet and at 32 degrees, 169.2 cubic feet. The weight of an equal volume of air at 62 degrees is 13.6 pounds, and the density of the gas is therefore 1.08.

The volumes of gas at different temperatures above 32 degrees are found from the formula: $V = (1 + .002t)\ t$.

We assumed 340 pounds of coal per ton of ware and 230 tons of ware requires 78200 pounds of coal during the five days of advanced firing, or .181 pound per second and the volume per second, at 32 degrees, becomes 30.6 cubic feet.

The volumes and density at various temperatures are as follows:

Temperature. (degrees)	Volume.	Density.	Velocity. Ft. per Second.
32	30.6	1.080—	....
232	42.8	.771	6.86
432	55.1	.600—	8.82
632	67.3	.491—	10.78
832	79.6	.415+	12.74
1032	91.8	.360—	14.70
1232	104.0	.317+	16.66
1432	116.3	.284+	18.62

The velocity of gases in factory chimneys varies from 10 to 20 feet per second. On the basis of 20 feet per second, and 1432 degrees temperature, the area of a stack for a 30-foot kiln should be 5.84 square feet and for 15 feet per second at 1032 degrees, the area is 6.12 square feet.

As a basis for average conditions, it is our custom to make the diameter, or side of the square, of the stack as many inches as the kiln is feet in diameter. If there are two or more stacks they are proportioned by the equalization tables. Rectangular kilns are reduced to equivalent circles and the diameters of these circles taken. A 30 foot kiln stack would by this rule have a diameter of 30 inches and the area would be 4.91 square feet and a square stack would be 30 inches square, or 6.25 square feet. The fourth column in the above table gives the velocities in a 2 foot 6 inch square stack under the assumed conditions.

It is evident that for high temperature ware where the coal consumption will run up to 600 or more pounds per ton in the same period of time as we assumed in our calculation and the stack temperature will be high, the stack area should be greater than that given by our rule, but on the other hand high temperature ware, such as silica bricks, in order to get the necessary temperature, is burned with a deep fuel bed and a scant supply of air, which reduces the volume of gas per pound of coal, and this must be taken into consideration.

The proper method for getting the stack area is to determine the quantity of fuel per second, convert this into gas volume at the required temperature, and proportion the stack area for a gas velocity not exceeding 20 feet per second.

Total Draft Intensity.

The draft intensity is the difference in weight between the stack column of hot gas and an equal column of cold air. We will assume a stack height of 60 feet. The gas weighs .087 pound per cubic foot and the air partly saturated may be taken as .0806 pound per cubic foot, both at 32 degrees.

The respective weights of 60-foot columns of air at 32 degrees and gas at 632 degrees will be:

$$60 \times .0806 = 4.836 \text{ pounds of air.}$$

$$\frac{60 \times .087}{1 + .002 \times 600} = 2.373 \text{ pounds of gas.}$$

Intensity = Diff. = 2.463 pounds = .2737 ounce per sq. inch.

Another method which enables us to get the result in feet of cold air direct and thus eliminates the decimal errors in converting ounces into feet of air is as follows:

$$I = H \frac{(\text{Wt. of cu. ft. of air} - \text{Wt. of cu. ft. of gas corrected for temp.})}{\text{Wt. of cu. ft. of air.}}$$

The results for 32 degrees air temperature are shown in the following table:

Total Intensity of a 60 Foot Stack.

Temperature.	Head in Feet of Air.	Head in Inches Water.	Head in Ounces.
232	13.7	.21	.12
432	24.0	.38	.22
632	30.5	.47	.27
832	35.1	.53	.31
1032	38.4	.59	.34
1232	40.9	.62	.36
1432	42.9	.66	.38

A cu. ft. of water at 32 degrees weighs 62.418 pounds.
at 39.1 degrees weighs 62.425 pounds.
at 62 degrees weighs 62.355 pounds.

If we assume 62.4 pounds for the water and .0806 pound for air, a cubic foot of water equals 774 cubic feet of air, and an inch of water will weigh 0.578 ounce. These factors will enable us to convert feet of air into inches of water or ounces, and vice versa.

If we multiply the feet of air by 12 to get it in inches and divide the product by 774, we will get the pressure in inches, and if we multiply this result by .578, we get the result in ounces pressure. For example, we found 30.5 feet of air for 632 degrees.

$$\frac{30.5 \times 12}{774} = .473 \text{ inch of water.}$$

$$.473 \times .578 = .2734 \text{ ounce.}$$

By direct calculation, using weights, we had .2737 ounce.

The method of calculation for any temperature, reduced to simple formulas, would be the following:

$$I = .111\, H \left(\frac{w}{1 + .002t} - \frac{W}{1 + .002T}\right) = \text{pressure in ounces.}$$

$$I = 12.4\, H \left(\frac{w}{1 + .002t} - \frac{W}{1 + .002T}\right) = \text{pressure in feet of air.}$$

$$I = .192\, H \left(\frac{w}{1 + .002t} - \frac{W}{1 + .002T}\right) = \text{pressure in inches.}$$

I = intensity or static pressure.
H = height of stack.
w = weight of cu. ft. of air at 32°.
W = weight of cu. ft. of gas at 32°.
t = Temperature of air above 32°.
T = Temperature of gas above 32°.

Velocity Head.

The intensities or heads above determined are totals, and part of this pressure is required to lift the weight of gases and maintain the velocity of their passage through the stack flue, and another part is required to overcome the stack resistance. The velocity head is determined by the formula:

$$h = \frac{V^2 d}{2g(1 + .002T)}.$$

h = velocity head in feet of air.
V = velocity of gas up the stack.
d = density of the gas at 32 degrees.
g = acceleration of gravity, 32.14 feet per second.
T = stack temperature.

The height of the stack does not enter into this problem since we wish to determine the force required to move a certain weight at a fixed velocity. For 632 degree stack temperature h = .888.

Friction Head.

The friction requirement is determined from the formula:

$$F = \text{Velocity head} \times \frac{H}{S} \times K.$$

H = Height of stack.
S = diameter, or side if square, of stack.
K = factor which varies between .05 for a smooth stack and .12 for a rough stack as determined by Grashof.

Richards uses an average value of .08 for K, but as kiln stacks are usually very rough, we will use .10. The friction head for 632 degrees will be $.888 \times \frac{60}{2.5} \times .10 = 2.131$ feet of air for an assumed stack 60 feet high and 2 ft. 6 in. square.

The results for the conditions we have been considering are as follows:

Velocity, Friction and Available Heads.

Temp.	Vel. Head in Feet of Air.	Friction Head in Feet of Air.	Available Head in Feet of Air.
232	.564	1.354	11.8
432	.726	1.741	21.5
632	.888	2.131	27.5
832	1.048	2.515	31.5
1032	1.210	2.904	34.3
1232	1.368	3.283	36.3
1432	1.531	3.674	37.7

Maximum Efficiency Temperature.

The engineering manuals give from 550 to 600 degrees Fahrenheit as the maximum efficiency temperature, or as generally stated the maximum weight of gases can be moved at this temperature.

The variable is in the available intensity and not in the stack requirement. If we multiply the stack resistance (velocity head plus friction head) by the density which gives the relative weight of gas moved, the result will be a constant for all temperatures. If we multiply the total head or available head by the density the maximum will be found at 632 degrees, probably less than this if we make the calculation for degrees intermediate between 432 and 632 degrees. Our calculations are based on a fixed amount of coal per second, but if we allow the stack to regulate the amount of coal burned, the maximum amount of coal burned will be at 632 degrees stack temperature, provided the conditions in the kiln are constant as would be practically the case in a boiler equipment.

(To be continued.)

CLAYWORKING IN MINIATURE.

By Kenneth C. Cardwell.

Materials for Artificial Gardens of Japanese Model Done in Clay by Ohio Concern.

IT IS ONE of the most valuable and commendable characteristics of American industries in general that they are ready not only to do new things of their own initiative, but to adopt—and adapt, too—from other countries that which is good; and this is quite as true of the numerous branches of the clayworking trades as of any other that could be mentioned. A particularly interesting case in point in this connection is a line with which the Wheatley Pottery, of Cincinnati, O., is making a decided success.

The traditional Japanese garden, with its flowered pools, high-arched bridges, tea houses and miniature pagodas, is familiar to most people; but there are a good many who are not familiar with the vogue which has arisen within the past few years for miniature artificial gardens of Japanese model, used as ferneries or other table or window ornaments. It is in the little clay pieces which go to make up these miniature Japanese gardens that the pottery referred to has made a hit, which, while nothing world-shaking, is still very much worth while, especially as showing the things that can be learned from the little brown brother.

As a matter of fact, of course, China and Japan were doing remarkable things with porcelains and other high-grade pottery centuries before Europe had advanced much beyond the crudest things in clayworking, and up to a comparatively short time ago the line of work referred to—these miniatures for artificial gardens—was done only in Japan. The various pieces used in lending the effect of reality to the tiny gardens, comprised within the bounds of a 12-inch or 18-inch clay fernery, were all imported from Japan, and substantial prices, considering the low actual value of the pieces, were paid for them.

It occurred, therefore, to the management of the Wheatley Pottery, which is always on the lookout for some new thing in its line, that there was no reason why these odd bits should not be made by it, as, indeed, there is no reason why they should not be made by any pottery with employes capable of doing a little simple modeling. Following the idea elucidated by Horace Greeley, when he said, "The way to resume is to resume," the company proceeded to begin making this odd and interesting line of stuff simply by beginning.

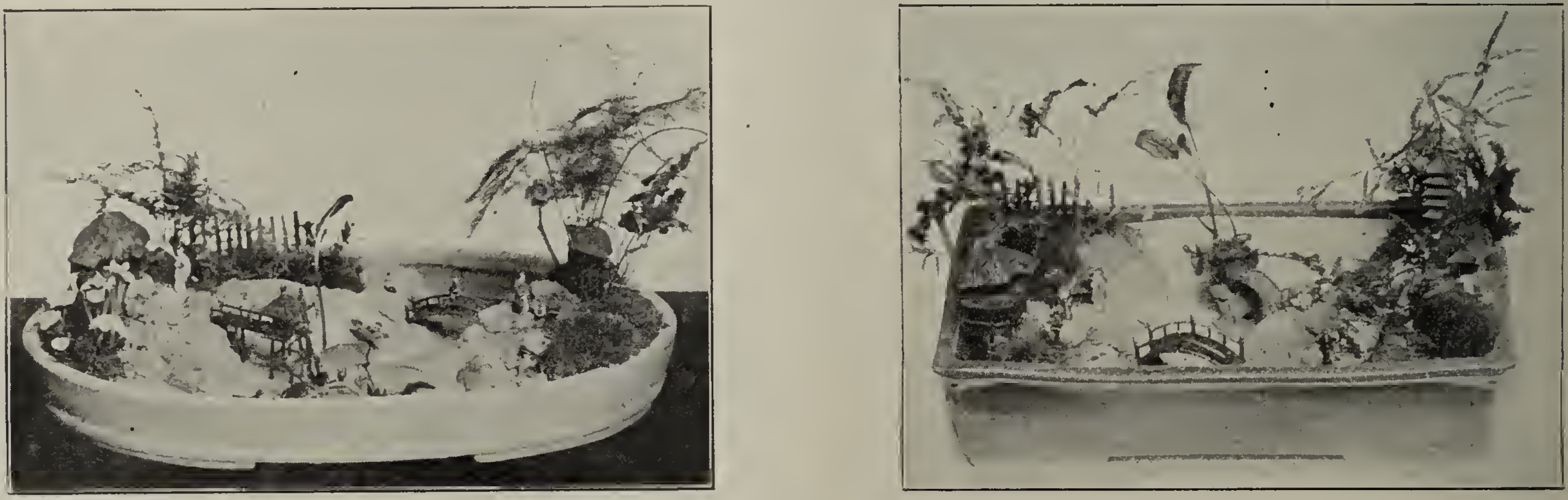
"It is surprising what a demand there is for this line of clay work," said an officer of the company not long ago, showing the remarkable variety of designs turned out. "It seems that the vogue for these miniature gardens is just beginning, and, as they are undeniably 'the thing,' it looks as if they will shortly catch on all over the country, with a consequently increased demand for these clay bits of which they are constructed."

As indicated above, the foundation of the garden is simply a clay fernery, of which the pottery referred to makes an attractive line in green mat ware. For the central part of the garden a grotto is desirable, and these are consequently made as a regular line, 4 to 6 inches wide and perhaps 4 inches high. Here and there are set imitation stones, flat-bottomed, so as to remain in place, and rounded into the likeness of real boulders or rocks. They are placed around in the "garden" to suit the landscaping taste of the maker, and add much to the effect of the whole, if properly used.

These are held in place by an inch or two of rich earth, in which grass seed and such other plants as are desired are planted, leaving room for the water which furnishes the scenic part of the garden, and gives occasion for the use of bridges. These are as long as wanted, with high arches, rails and steps, all roughly modeled to look very much like the real thing. Pagoda-like clay lamps, miniature pagodas, boats, and numerous other objects of clay comprise other bits which are used in these novel decorative effects. The whole is aided immensely by the use of tiny Japanese figures placed here and there, but these are not made in clay, being entirely too small to constitute a practical application of the versatility of the ordinary pottery.

The Wheatley Pottery Company distributes these goods much as it does its other lines, which consist of garden pottery, tiles for use in buildings and mantels, and so forth. Its representatives sell them by sample to department stores and novelty dealers, especially those featuring Japanese goods. The various pieces described are put up in bundles and are ordered by number, as a certain quantity of this number and a certain quantity of that; and, as stated above, the demand has already grown to surprising proportions, indicating the good business of taking up the manufacture of this apparently insignificant and unpromising line.

The ferneries in which the miniature gardens are placed are in themselves a good and profitable line, as they are used very widely, entirely aside from their employment in the connection described. They vary in size and shape, but are generally rather shallow, and round or oval. The green mat finish seems to be much the most popular, especially in connection with the gardens, as the shade is suggestive of the coolness which the whole thing aims at in effect. For use as ordinary ferneries, too, this shade is particularly appropriate, and the pottery is making and selling these goods in good quantities.


Miniature Clay Figures and Objects Give Realistic Appearance to Artificial Toy Gardens.

Written for THE CLAY-WORKER.

BRICK NEWS FROM EVANSVILLE.

THE BRICK and clay manufacturers of Evansville and southern Indiana report that October was a little dull and if anything showed a small reduction in business over the corresponding month of last year. November has started in fairly well and the manufacturers are hopeful that it will show some improvement in trade. Some of the brick plants in Evansville have been operating on fairly good time but labor scarcity is reported by some of the manufacturers and they assert that in spite of the fact that they are paying the highest wages in many years that it is hard to get all the workmen they want. Evansville manufacturers say that taken as a whole this has been a very good year for their out of town business but that their local business has not been what they anticipated at the first of the year. There has not been as much building done in Evansville this year as last. The Standard Brick Manufacturing Co., one of the largest concerns in Evansville and southern Indiana, operating a number of plants, has had a nice business in towns in Indiana, Illinois and Kentucky, and they have shipped out a great many brick. The building season in Evansville has, however, been far from satisfactory and it is believed it will not show much picking up before early next spring. The work on the Junior high school at Evansville is progressing nicely, this being one of the biggest jobs in Evansville during the season. Several other school buildings in that city have also been constructed. The $50,000 school building at Boonville, Ind., a few miles east of Evansville, is also being pushed rapidly to completion. Several large buildings at Vincennes for which the Standard Brick Manufacturing Co. furnished the brick are also nearing completion. John Andres, the secretary and treasurer of the company, says that out of town business of his company has been the means of keeping their plants running this year. He does not look upon the industrial situation from a pessimistic standpoint and says he always sees a silver lining in the clouds. His company will furnish the brick for a large bank building at Mt. Carmel, Ill., the contract for which has just been let, and for the new Eagles' Home at Mt. Vernon, Ind. The new brick fences at the Oak Hill cemetery and St. Joseph's cemetery at Evansville have been completed. Fences for cemeteries are something entirely new in southern Indiana but in the East the idea has been carried out for a number of years past, it is announced.

Mr. Andres has been elected a director in the Evansville Chamber of Commerce. Mr. Andres and H. C. Kleymeyer, general manager of the Standard Brick Manufacturing Co., were among the organizers of the Chamber of Commerce in Evansville and the body has done a great deal toward putting Evansville on the map during the past two years. Messrs. Andres and Kleymeyer are also members of the Evansville Rotary Club, one of the live wire organizations of that city that has accomplished a great deal for the city during the past year.

People in southern Indiana and western Kentucky have become more interested in the question of good roads during the past year or so. Much of the roads along the proposed Dixie Bee Line Highway that will run from Danville, Ill., to Adams, Tenn., have been completed. This will be a part of the natural highway from Chicago to the South and the roads when completed in all the laps will be among the best in the country, it is pointed out. Brick and clay manufacturers are among the boosters for good roads in southern Indiana. The proposed highway from French Lick, Ind., to Evansville has been "O. K'd." by the Indiana State Highway Commission and it is expected that a part of this proposed highway will be constructed of brick. Brick as a road building material, it is pointed out, is hard to beat and in fact has no superior. People in the Evansville region are coming to realize this more and more each year and it is safe to predict that within the next few years southern Indiana will have many roads that are built of brick. The city of Evansville has many miles of brick streets and some of them were put down a number of years ago and are as good today as when first constructed. Boonville, Ind., recently completed its first brick street and it is expected the city will have more of them soon.

Grayville, Ill., a live city a few miles west of Evansville, is immensely proud of its several miles of brick streets that it will have when the improvement started a few months ago will be completed. The work is going right ahead and it is expected the contractor will finish the work within the specified time. The improvement will cost the city of Grayville something like $75,000.

Henry Clemens, manager of the large sewer pipe factory at Cannelton, Ind., who is a frequent visitor in Evansville, says business has been fairly good during the past few months. His industry is one of the largest in Cannelton and Mr. Clemens is one of the most public spirited men in his city.

Henry W. Flentke, who, for many years was the general manager of the Crown Pottery Co. at Evansville, died a few days ago at Prescott, Ariz., where he had gone a few weks before on a business deal. While in Prescott he was seized with pneumonia and lived but a few days after being stricken. Mr. Flentke was one of the best known pottery men in the middle west and was but fifty years old. He was connected with many of the business enterprises of Evansville. Besides his wife he is survived by one son and three daughters.

Aaron M. Weil, president of two of the largest pottery companies at Evansville, who has been in bad health for the past several months is some better and his many friends are hoping for his full recovery. Mr. Weil was one of the boosters for the recent Liberty Loan campaign in Evansville. Michael Helfrich, president of the Sanitary Pottery Co. at Evansville, bought $150,000 worth of the Liberty bonds during the campaign. John Andres and H. C. Kleymeyer were also leading workers in the campaign and subscribed liberally.

The employes of the Crown pottery at Evansville went out on the recent strike that was called from the headquarters of the potters' union at Liverpool, Ohio. They remained out but a few days and are now back at work. The two other large potteries in Evansville were not affected by the strike and have been operating steadily for some time past. Pottery owners are fearful that the car shortage during the winter months will interfere some with their business like it did last winter.

A. HOOSIER.

THOUGHTS TO THINK ABOUT.

Price is a poor thing with which to plug the defects in a faulty product.

When a man becomes weak-kneed in standing up for his rights he is inviting abuse and imposition.

It is not enough to just become acquainted with your competitor—become friends, and then you both have a chance to profit.

We are told that it is impossible for a man to be really happy unless his conscience is free. Therefore the price-cutter either has no conscience or else he can't be happy.

It is just as essential to have harmony between different competing branches of the clayworking industry as it is to have co-operation between individual concerns making the same line of products.

To make a bigger brick than the other fellow so as to get his price, or to make a smaller one as a means of profiting at the price is whipping the devil around the stump. Stick to standard sizes and save the industry from confusion.

SOME WINTER WRINKLES.

Pertinent Pointers on Well Known Practices in Protection of Machinery and Equipment During Cold Seasons.

THE WINTER SEASON not only taxes the capacity of the enclosed power plant, because of the extra demands made upon it, but it often proves very trying in connection with the operation of outside or exposed equipment. Indeed, there is plenty of trouble comes from one source and another to make winter time a sort of nightmare to those in charge of hoists, pumps and all exposed and portable equipment. Still, when we come to analyze it, the main difference between winter and summer is made up of frost, of a difference in temperature. It is this difference in temperature, though, that causes lots of trouble that must be contended with every winter, and those who would get through the winter season with the least trouble and expense for repairs must take time and trouble by the forelock, so to speak, and get into action with as many practical winter wrinkles as may be applied in each case.

In instituting an order of general cleanliness, which should go along with all wrinkles and precautions for the winter season, it should be remembered that accumulations of soot on the outside of boiler shells and flues are just as wasteful of heat as an accumulation of scale on the inside. Both are non-conductors and offer strong resistance to the flow of heat from the fire to the water. The iron in boiler shells and tubes is a good conductor of heat, but soot and scale are both very poor conductors. Therefore, to get any degree of efficiency one must keep the boilers clean inside and out. About the only difference between the outside accumulations of soot and inside scale is in that the scale accumulations are likely to cause blisters or burning of the metal, whereas the outside soot does not threaten with any danger of this kind, it simply reduces the quantity of steam power obtained with a given amount of heat in a fire box. The right idea, however, is to keep the boiler clean inside and out and to give special attention to this order of cleanliness during the winter weather, when the tax on the steaming capacity is heavier than at any other time.

Pipe Coverings.

Usually about the first precautionary measures taken as a safeguard against frosty weather and the extra condensation and the troubles arising from it is to cover exposed pipe with some insulating material. Of course, every exposed part of boilers should be covered, too, and even the stack. This is not often done with portable equipment, but is something that could be done to advantage and is recommended as a good idea to experiment with. There are many different offerings in the way of coverings, both for boilers and pipes, and which to use depends materially upon local conditions. For long runs of pipes, either under ground or on top, there are various offerings in the way of conduit coverings, including some of burned clay, some that are composition and some made of wood. There are some very inviting propositions in wood conduits or coverings which make a strong appeal where there are long lines of pipe because wood is a very slow conductor of heat and makes a splendid insulating material where conditions are right for its use. It is not a material, however, that lends itself for short lengths and turns in pipes, and every man will have to figure out for himself after studying the various offerings, what will fit his needs best. First and last, there is quite a line of offerings and usually the manufacturers of them are very glad to furnish literature describing them in detail. The wise man in charge of a plant will study them all and listen to salesmen who present their claims and then be guided by his own judgment as to which fits in with his particular needs best. Sometimes it may even require two or three different kinds to fit him out properly.

Dangers of Condensation.

When frosty weather comes, extra precautions should be taken in warming up engine cylinders and clearing all condensation out of them before the working load comes on. Otherwise, there is likely to be injury to the engine from water in the cylinder, especially if it is an engine of modern type, with but little clearance between the piston and the cylinder heads. Many engines have been wrecked by careless starting up on a frosty morning before all the parts have been thoroughly warmed and the condensation cleared out. If the engine cylinders are not jacketed, it is a splendid idea to cover them now, and anyway, see that the engine is thoroughly warmed up and let it run without load for a while in starting off when the weather is frosty.

Thaw Out the Tools.

All tools that have to be used should be thoroughly warmed up and freed from frost before using, because, if they are not, they are likely to be broken, and besides, they are disagreeable to handle and work with when frosty. Wrenches, for example, are not only cold and have a benumbing effect upon the hands, but the jaws will be slick and hard to keep gripping onto a nut, and a hard strain is likely to break a jaw or something. Usually the tools can be warmed up by arranging them around the boiler, and if this is not practical, a small fire should be made and all tools kept warm that are used in the work.

All parts of machinery or equipment that is to be worked with, to be adjusted or taken apart or put together, should always have the frost thawed out before any work is done. This applies to bolts, nuts and to all metal parts, and anything that is to be worked upon or adjusted in any way. Moreover, all working parts of machinery or equipment should be thoroughly cleared of frost before putting it to work, because frozen metal snaps and flies easily from shock and a little precaution in this matter will often save a big repair bill.

Care of Piston Rods and Packing.

Piston rods and the packing around them in engines and pumps should be looked after carefully to see that they are free from frost before starting up. A good precaution in frosty weather is to oil such parts freely when you shut down at night and get an oil coating worked onto them so thoroughly that it will keep out moisture. Then the frost is less likely to do harm, and with a little warming up in the morning they will work free and smooth. Indeed, thorough oiling of every journal and of every moving part of the engine and machinery the last thing at night, when shutting down, is a splendid practice and it insures proper lubrication in the early morning, when it is very important to prevent heating, and it helps to keep down moisture coatings which result in rust as well as frost.

How to Warm Up Machine Parts.

It is a lot easier to say warm up different parts here and there than it is to do it, and there follows, naturally, the question of how this warming up shall be done and what means or appliances shall be used to accomplish it. Of course, all tools and appliances that can be taken to a fire or the furnace can be warmed easily enough, but those attached parts of machine must have fire or some other heating agent taken to them. For this purpose, perhaps the oil torch is about the best and most convenient thing, or in lieu of this, one may make a torch with oily bits of waste attached to a stick or with wads of paper or any flammable material. One should bear in mind that not too hot a fire is wanted, nothing like a gasoline blow pipe torch, because with these there is some danger of burning the surface of parts now and then before warming up through and through. It takes time and patience to warm up machinery parts properly, but it is one of the duties of frosty weather operations that careful attention to will bring its rewards in the way of minimizing trouble and repair expense.

The Use of Steam and Hot Water.

The writer has long nursed an idea that a sort of ideal thing for this purpose would be a steam hose and nozzle attached to the boiler and of sufficient length to reach the different parts of the equipment that it is desired to warm up. There is no danger of overheating with steam, and steam under pressure is a penetrating thing that will get in and warm up a complexity of metal parts in a satisfactory manner and at the same time will help clear off accumulations of dirt and grease. Hot water itself is a splendid thing and at times one may facilitate most of the morning warming up task by drawing some hot water from the blow-off pipe and applying it where it can be applied without too much attendant mess and trouble resulting.

Drain the Pipes and Valves.

That all water pipes and all exposed valves, whether they are in water pipes or steam pipes, should be carefully drained at night, it may be presumed that every one is well enough aware. However, the fact remains that there are many valves ruined by frost on both steam lines and water lines, so a word of precaution on this point seems to be in order, notwithstanding everybody should know and understand, naturally, the importance of draining out. Every valve that can accumulate and retain moisture, whether on a steam line or a water line, should have a drain cock in the bottom or in the lowest point, which can be opened at night to let all moisture escape and prevent that accumulation of expanding ice which disrupts and destroys valves and their seatings. All water pipes should be laid so that they will naturally drain back into the reservoir or supply point, and no sags permitted that will accumulate and hold water to cause freezing. Moreover, it is well, where practical, to turn a steam jet into water pipes and blow back through them and clear them of sediment and any other impediment and warm them up at the same time.

Speaking of valves and valve parts, valve stems and their packing constitutes one of the items that should be carefully lubricated at night and then warmed up with a torch in the morning before turning them because they will often be found stiff and stuck, and the wrenching strain necessary to start them may result in breakage.

Babbitting On Cold Journals.

When it becomes necessary to do babbitting of machinery parts in frosty weather that cannot be thoroughly warmed up and kept warm, one may find relief by wrapping the journal to be babbitted with a sheet of paper. A sheet of ordinary writing paper is good, and it will not only prevent spews, but it is a splendid provision against rather tight journals from babbitting. In other words, the thickness of paper just about makes the clearance space required between the babbitted box and the journal. It can be tied on with thread, or if a groove or series of grooves should be desired to help lubricate, these can be formed by tying the paper wrapping with a heavy string or cord.

THE FIRST BISC DOLL HEAD MANUFACTURED IN THE U. S. A.

THIS WAR HAS brought about quite a number of changes, especially in the industrial line, which we all notice. There has been quite an improvement in one particular line, namely, the manufacture of Dolls and Toys, which have all, heretofore, been imported from Europe. There were only about three factories manufacturing this line of goods in the United States prior to the war, whereas in the past few years, they have increased to about two hundred, and it can hardly be realized that it has so greatly improved in this short time.

It was for this reason that Mr. Ernest Reinhardt started a doll factory for the manufacture of joint dolls, in Philadelphia, Pa., and also had a department for the dressing of these dolls, but he used the imported doll heads on the same. After he was established a short time, he was unable to procure any Bisc Doll Heads, owing to the fact that they were imported, and could not be procured in this country, so he had to give up the manufacture of dolls and commence experimenting on Bisc Doll Heads.

At first he was undecided what to do, to give up the idea altogether, or to begin experimenting on the same. He finally decided to begin with the same, which was not as easy as he anticipated, as he was unable to get foreign clays, and had to try the different domestic clays in order to procure the right kind which is necessary for the manufacture of these heads. He made models, ordered special machinery, built a kiln, decoration plant, etc., so after a few years of hard labor he accomplised the task, which so far, no one else in the United States has been successful with.

Now Mr. Reinhardt has won the fame to be able to manufacture the well known "BISC DOLL HEADS", which are well liked by both children and adults.

Presently Mr. Reinhardt is established in East Liverpool, Ohio, where he has been for the past year, and is well known both here and throughout the country, for his great invention, as he is also able to manufacture the "Character Heads", which are the most liked heads that have even been on the market.

All the doll hospitals, wholesale and retail dealers, are very pleased to think that they will soon be able to purchase these Bisc Heads which they have been trying to get for the past few years, but without avail, and are congratulating Mr. Reinhardt for his good work. Even the children are writing small letters saying that they hope they will soon be able to purchase dolls with the Bisc Heads, which are well liked by them, also to be able to replace the ones which have been broken, so that they will again be able to play with their most favorite dolls.

The manufacturers of dolls who had to use composition heads, which are made in Paris and consist of glue, lime, plaster, etc., can hardly wait until they can again purchase the "real thing," which, of course, is the "Bisc Doll Head."

This is another evidence to show what can be performed and discovered through energy and endurance.

Mr. Reinhardt has also invented a fuel to use oil instead of coal or gas, which he has experimented in his Philadelphia plant, and should there be a shortage of either coal or gas, he will install the same in his present plant, and will also install the same for any other potteries who desire to have it.

THE PUG MILL---ITS USE AND ABUSE

By Robert Twells.

IF WE HAVE DIFFICULTY in getting our clay pugged sufficiently; we call in an expert for advice, who recommends at once to throw out our short pug mill and put in a longer one; or if we already have a long one, recommends that we buy another and place at the end of it, allowing the clay to fall from the first to the second and pass through it before reaching the brick machine. This advice may be all right and may not. We will see later.

What do we expect the pug mill to do? We want it to work up the clay into a tough plastic state. This cannot be done by simply cutting the clay up and adding water to it and each knife simply pushing it along so that the other knife can reach it and do the same; this is not pugging, this is only turning the pug mill into a conveyor. In order to pug clay, it must be squeezed into itself. In order to do this in its travel through the mill, there must be places where it travels slower than other places, so the clay where it travels fast will overtake and press into that which is traveling slow. This is accomplished by many different ways; such as having the knives set so as to press down as well as press forward; also by having straight knives at intervals, thus making a slow moving zone. The same thing can be done by having every other knife half worn out or short, its companion knife being long, so it can press the clay past the short knife. The same thing can be done by having all the knives long and placing rings on the shaft between the knives, in this way making the knives press the clay through this thin space of non-moving clay; such space must be very thin. However, these places are provided for by the blades of the knives being narrower than their hubs. Some pug mills have an adjustable slide at the discharge and so as to retard the clay; it is a good thing, but one or more short knives on the end of the shaft answers the same purpose.

Now, right here I might as well confess to the reader that my object in writing this article is to show that successful pugging does not depend on the length of the mill or mills so much as to how well it pugs. Neither is it possible for a very long mill to pug as well in proportion to its length as a short one. For the simple reason that the strain on the shaft and the wear on the gears would be too great. The result is that in order to prolong the life of the machine we have to treat it too much as a conveyor rather than a pug mill.

The result is that with the same power that it takes to operate a long mill even as a conveyor we can run a short mill without any undue strain or wear and let it pug the clay and not merely convey it.

If we have a twisted shaft, broken or unduly worn gear wheels, we are abusing the pug mill by retarding the clay too much; the remedy is to put in a few new knives where it is retarded the most or raise the slide at the end. When the belt commences to slip, provided it is reasonably tight, that ought to be warning enough for us. In fact, we ought to see and know that when the mill commences to fill up that the knives are getting worn and that unless renewed at once the machine must break.

In order to get uniform results in good pugging and requiring the same amount of power, we should only put in about six new knives at a time and do it not less than once a month, or oftener, if required. This is better than to renew all the knives at once, as this turns it too much into a conveyor and this is not desirable.

Shales that contain very little plastic material do not work up tough and is not so hard on the shaft and gears. Material like this can and should be pugged in a long mill and if necessary passed through two mills before reaching the brick machine.

The shale should enter the machine from above, about six inches from the end, in a flat stream about fifteen inches wide. This stream of shale should fall between two one-inch water pipes, there should be a row of holes one-eighth inch large and one inch apart as wide as the clay falls on each pipe; this gives a double stream of water playing on the shale as it drops. Each row of holes should face each other the holes looking slightly down, each stream of water crossing the other in the form of the letter V. The shale should be arranged to fall into the V. In this way each particle is thoroughly saturated before it reaches the bottom of the pug mill. It is then in good shape for the machine to get its work in on it. The two water pipes should be connected to a larger one and a shorter piece of hose pipe should be connected so it can be used to water any dry spots that accidentally gets by the permanent place where the water is applied. This hose should be long enough to put water in the brick machine when it has been standing for a long time. Otherwise, it should be used as little as possible, as the best place to get the water in is where the shale falls in.

The clay should be supplied through the pug mill in quantities just to suit the capacity of the brick machine—not too fast to arch it over nor so slow as to cause it to run partly empty.

It is very desirable that one good man should be kept on the pug mill, but if compelled to change, there are no mysterious secrets about letting in enough water to make the clay work up into a stiff paste that can be squeezed in the hand instead of a soft slush that would run through the fingers and any man of ordinary intelligence can soon catch on to it; the main thing in teaching a new man is to get a reliable every day man.

WHY WORRY?

A soldier of France is said to be the author of the following bit of philosophy. He certainly ought to be president of the Don't Worry Club:

"You have two alternatives: Either you are mobilized or you are not. If not, you have nothing to worry about. If you are, you have two alternatives: Either you are in camp or at the front. If you are in camp you have nothing to worry about.

"If you are at the front, you have two alternatives: Either you are in reserve or you are on the fighting line. If you are in reserve, you have nothing to worry about.

"If you are on the fighting line, you have two alternatives: Either you scrap or you don't. If you don't, you have nothing to worry about.

"If you do, you have two alternatives: Either you get slightly hurt or you get badly hurt. If slightly, you have nothing to worry about.

"If badly, you have two alternatives: Either you recover or you don't. If you recover, you have nothing to worry about. If you don't, and have followed my advice clear through, you have done with worry forever."

Written for The Clay-Worker.

WITH THE CLAYWORKERS OF CINCINNATI AND VICINITY.

THE NEXT FEW MONTHS are not likely to see any notable increase in the demand for brick and clay products and other forms of construction work. The near approach of winter, to which can be added the general inactivity of the building situation, is not going to help matters at all. In fact, the clay men are not looking forward to any very decided changes and are merely filling in orders that have been taken, and making most of the conditions over which they have no control.

While there are a number of building projects under way, and some others contemplated for the near future, the lack of real life to the industry has been noted for some weeks. It might be stated that the conditions are not normal, but there are so many reasons for this state now that it is not to be wondered at; in fact it is but the natural outcome of a period wherein there have been a number of important factors at work to counteract anything above normal conditions. So the philosophic attitude on the part of the clay men is commendable at least.

The closing down of the brick plants while not complete is nearly so, only a very limited amount of work being attempted at this time. When we consider the lack of demand, coupled with the labor troubles; the difficulty in being able to get all the labor that might be used where the operations are of such a nature as to demand this, there is little cause for wonder. This has been noticeable where the character of the commodity makes possible the all the year operation of the plant.

One line of clay work that is now very active is that of fire brick and kindred lines. But there is not a great deal of such products produced here, and for that reason there is no very great amount of news connected with it. There is every indication, however, that this branch of the industry will continue active for months, and there is cause for gratification here at least.

A new theater is to be built here by the Keith Theater Company on a plot of ground 125 by 200 feet to an alley. The location of the building will be on the north side of Sixth street between Vine and Walnut streets. There are a number of old buildings on this ground that are now being wrecked in order to make a place for the new structure. The contract for this building has not yet been let.

Some more than usual activity is noted in connection with the building of school houses here, and this, together with the future prospects in this way, should be a help to the brick men, as these buildings are most always erected with brick. Among these buildings are the Harriett Beecher Stowe school, to be erected at Seventh and Cutter streets, the plans for which have been drawn by Architects Tietig and Lee. The building will cost about $325,000; of Spanish-Renaissance type, of brick and terra cotta. This is an increase of about $70,000 in the cost as compared with normal times and shows the great advance in the cost of this character of work. The building will house 1,800 pupils. It will be known as a "complete school," including all branches—manual, household, swimming pool, etc.

A new school is to be erected on Eighth street to accommodate 1,200 pupils. This will be similar in type to the above school.

A. W. Hayward will build two brick residences of two and one-half stories on Probasco, to cost $6,000 each; and one two and one-half story brick residence on Probasco, to cost $4,500.

A high school is to be erected at Lebanon, O., a total bond issue of $95,000 has been submitted for the purpose. The contract is to be let in the near future.

Mrs. E. P. Harrison will erect a two-and-a-half-story brick residence to cost $40,000 on Walnut Hills. It will be 45 by 85 feet. Work has been started.

The Crown Overall Company will build a new plant at the corner of Third and Plum streets. The company has increased its capital stock $250,000 for the purpose.

A one and a half-story brick residence will be erected by J. M. Stewart, to cost $4,500, on Kincade, north of Montgomery.

There is little to note with the D. C. Shorey Brick Company at this time, though Mr. Shorey stated that he had been figuring on some sales that would be of moment. This concern has enjoyed a nice demand for some time and has placed some orders for brick that were of the good old kind.

Quiet reigns with the Cincinnati Clay Products and Supply Company and, according to Mr. Wilde, there is nothing much to note at this time, particularly as applied to the face brick industry. It looks like a very inactive season for a time at least.

Mr. Blair, of the Blair Brick Company, said that conditions with his concern were very dull now and that there was little in sight to offer any change for the next few months at least so far as the building brick industry is concerned.

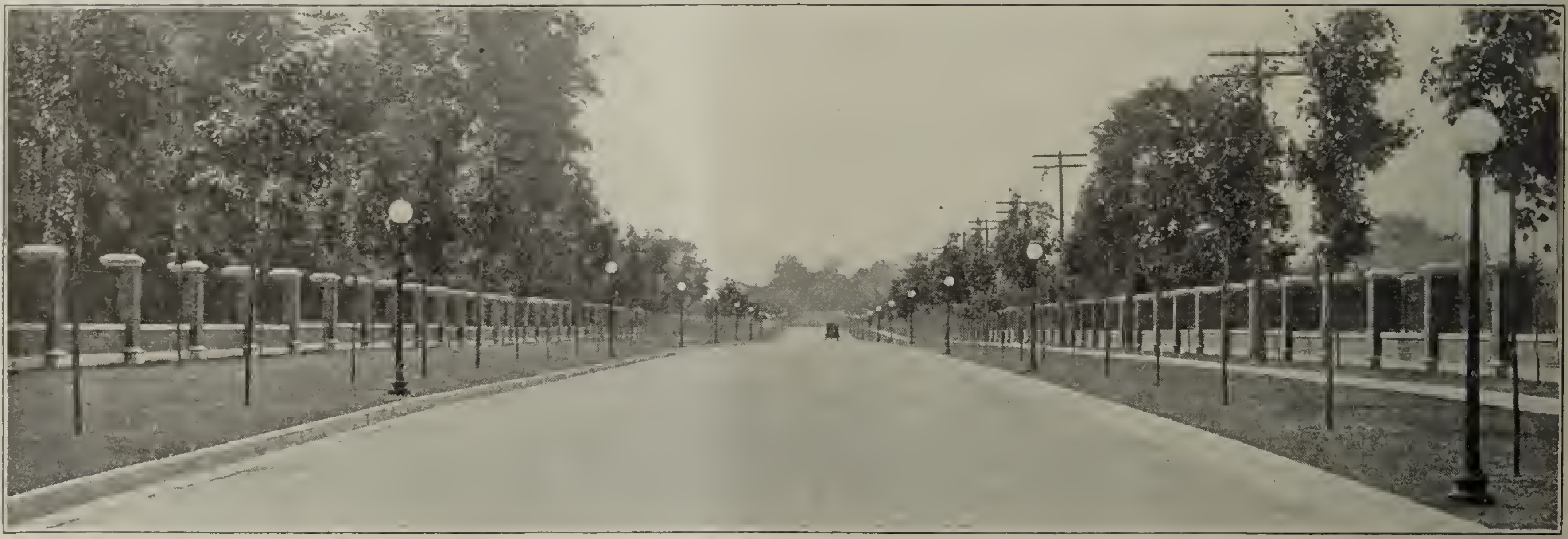
Operations have ceased with the Cincinnati Brick Company and the plant will remain closed for some months now. The incentive to operate, had the weather continued good all along, would not offer much in the way of an inducement now.

Sales have been very fair with the Cincinnati Clay Company, as this company manufactures nothing but sewer pipe, flue linings and kindred lines, there is nothing to mar the operations of the plant and the demands are very good with them now. There has been one trouble, and that has to do with the labor question. The difficulty to get all the labor that is demanded, owing to the call from Government sources, has been one of the handicaps with this concern. CINCY.

OPPORTUNITY FOR BRICK MEN TO EXHIBIT.

The promoters of the Grand Rapids National Better Homes Show, which is to be held in the Klingman Exhibition building in Grand Rapids, Mich., Nov. 28, to Dec. 8, are much elated over the number of exhibitors who have applied for space. Nearly everything that enters into the making of a home, from the material used in the construction to the draperies and pictures, and kitchen utensils, will be exhibited. This is an opportunity for the brick manufacturers, especially those in Michigan, to get before home builders. A recent prospectus states that "the manufactured articles, furniture, food products, etc., that will be eligible for exhibit will include high-class furniture, draperies, carpets, rugs, curtains, decorative effects and goods, wallpapers, lighting fixtures, art goods, thrift-food and utensils for Better Homes cookery; bath and kitchen better utilities. In fact, every article of quality that goes to make up a real American home will be permitted to occupy space at the 'Better Homes Show.'"

The requirements of brick building ordinances calling for metal piping instead of porcelain tubing to carry electric light wires in buildings may cut the consumption of this class of pottery work a little, but this is more than made up for by other calls that electricity makes for the pottery product.



A Glimpse of Maple Road Boulevard (Thirty-Eighth Street), Indianapolis.

IN AND ABOUT THE CONVENTION CITY.

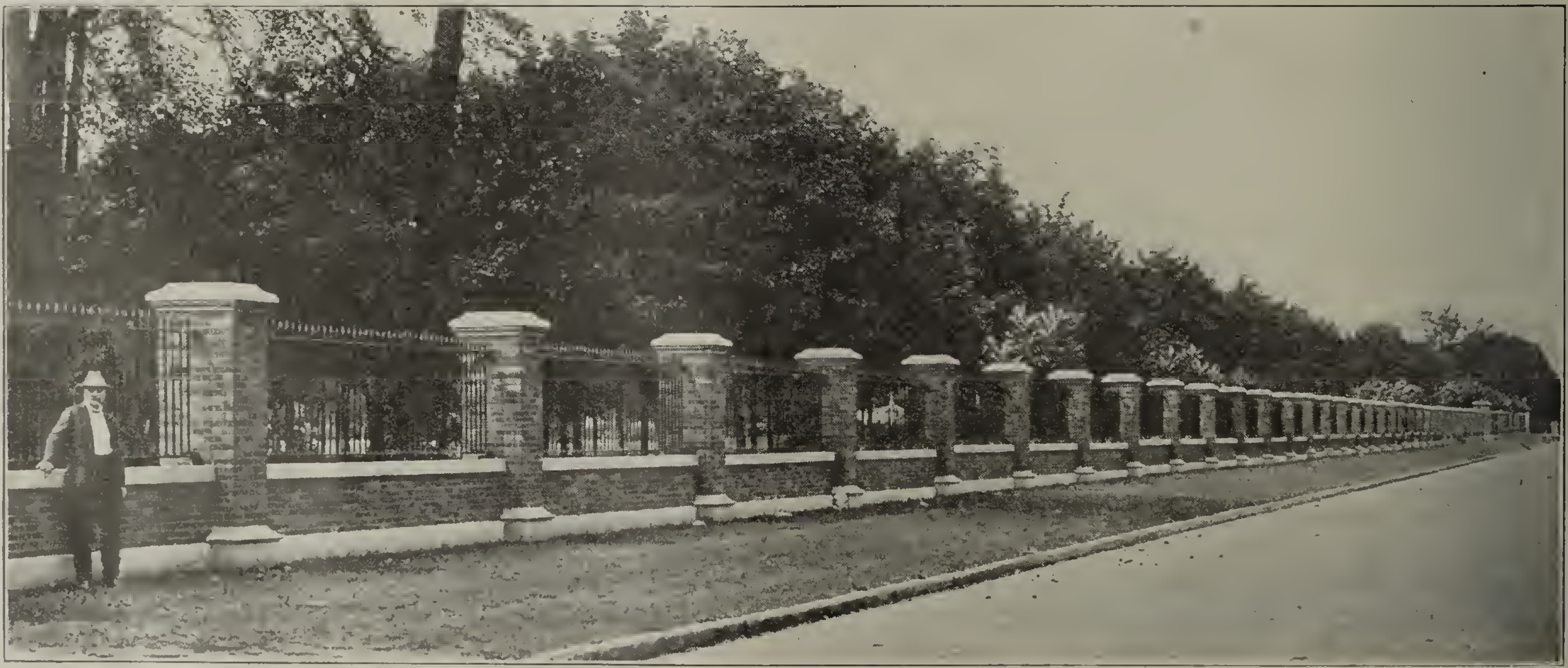
A Two-and-One-Half Mile Stretch of Brick Fence That is an Important Decorative Feature of a Fine Boulevard.

"SOME BRICK FENCE," said a visitor to the Convention City who was being driven about Indianapolis recently, and saw for the first time the long rows of fine brick columns which line either side of the Thirty-eighth street boulevard. The latter is a part of a boulevard system which, when completed, will extend entirely around the city.

Our visitor was eminently correct. As the reader will see from the accompanying pictures, it is some brick fence. Nothing of the sort anywhere that we know of quite equals it for beauty and stability. There are two and one-half miles of this brick fence, in the construction of which 500,000 face brick were used. The brick were furnished by the Western Brick Company, and are their rough texture "Empire" brand, tobacco brown in color. The walls and columns are laid in black mortar with tooled joints. The base and caps are of cut stone. The posts are nearly 4 feet square, 7 feet in height and are 25 feet apart.

The brick fence adds immensely to the beauty of this section of the boulevard, which is a fine pleasure thoroughfare. A brick fence is always an unmistakable evidence of thrift, only the well-to-do indulge in such a permanent improvement, though as a matter of fact, the brick fence should be the rule, rather than the exception. Because a brick fence is permanent, it is really economical. These are points that the brickmaker ought to bring to the attention of the prospective builder who, when properly advised, must admit that brick are superior for all exterior work. No other material or construction is quite so good as good brick work.

The city boulevards are of recent origin—they came with the automobile, so to speak, which is one of the important products of the city, several of the most popular cars on the



Part of a Two and and a Half Mile Stretch of Beautiful Brick Fence.

market being made here. As Indianapolis is the greatest inland railroad center in the world, it is naturally a great manufacturing center. Those who attend the coming N. B. M. A. convention the second week in February will be afforded an opportunity of visiting and inspecting almost any manner of industrial plant in which they may happen to be interested. If weather conditions are permissible, those who desire to do so will be shown the great brick-paved speedway, which made Indianapolis famous in the world of sports. Many other things of interest will be shown the visitors convention week.

CHANGE OF DATE

OFFICIAL ANNOUNCEMENT.

THE THIRTY-SECOND ANNUAL CONVENTION OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION WILL BE HELD IN INDIANAPOLIS, IND., FEBRUARY 10 TO 16, 1918.

THE AMERICAN CERAMIC SOCIETY, NATIONAL PAVING BRICK MANUFACTURERS' ASSOCIATION, AND OTHER ALLIED ORGANIZATIONS WILL MEET AT THE SAME TIME.

AS PREVIOUSLY ANNOUNCED, the thirty-second annual convention of the National Brick Manufacturers' Association will be held in Indianapolis, but to accommodate those associated with the clay schools and the American Ceramic Society, it has been found necessary to defer the convention a week. Instead of meeting the first week in February, as originally announced, the convention will be held the second week, February 10 to 16 inclusive.

As in former years, the American Ceramic Society will hold its sessions Monday, Tuesday and Wednesday forenoon. The National Paving Brick Manufacturers' Association will hold its sessions Monday and Tuesday, and there will be meetings of kindred associations, such as the Drain Tile Manufacturers, the Hollow Block Manufacturers, the Indiana Division of the American Face Brick Association, etc., on the same dates.

The formal sessions of the N. B. M. A. will begin Wednesday afternoon and continue Thursday and Friday. All the meetings will be held in the convention halls and assembly rooms of the Claypool Hotel, which will be headquarters and which affords unexcelled facilities for all such gatherings, whether large or small.

The Claypool Hotel Headquarters.

A large attendance is anticipated, and it is therefore advisable to request reservation of such accommodations as may be desired at an early date. In writing in regard to rooms, etc., the date of intended arrival should be mentioned together with the number in party and character of accommodations desired. The Claypool Hotel has an unusual number of large rooms with bath, so that parties desiring to room together may be accommodated, and single beds furnished when desired. If single rooms ensuite are preferred, they may be had for the asking. The rate will be from $2.00 up, on European plan, according to location, etc. For reservations, address the Claypool Hotel, Indianapolis, or Secretary Theo. A. Randall.

The grave and important problems that now confront every branch of the clayworking industries make it exceedingly desirable for the representative men in each branch to meet and consider carefully the new conditions under which plants must be operated and products marketed. Never before was there a more urgent need for exchange of views on the various questions which are now perplexing the wisest and most experienced manufacturers in the land. Be it remembered that "in a multitude of counsel there is wisdom." Every member is expected to be present and do his bit toward meeting the new conditions in a manner most apt to spell the largest measure of success during the following season.

A large attendance is hoped for and a warm Hoosier welcome awaits each and every visitor. Those desiring further information relative to the program of events or the requisite of membership in the various bodies will please write the Secretary at Indianapolis.

Claypool Hotel, Headquarters, Thirty-second Annual N. B. M. A. Convention.

THE EXECUTIVE COMMITTEE.
FRITZ SALMEN, President.
THEODORE A. RANDALL, Secretary.

CONVENTION DATES.

American Face Brick Association, French Lick Springs Hotel, French Lick, Ind., December 12, 13 and 14. R. D. T. Hollowell, Secretary, Fulton Building, Pittsburg, Pa.

Face Brick Dealers Association, French Lick Springs Hotel, French Lick, Ind., December 12, 13 and 14. Harold W. Holmes, Secretary, Detroit, Mich.

Sand Lime Brick Manufacturers Association, Lafayette Hotel, Buffalo, N. Y., January 29 and 30, 1918.

Canadian National Clay Products, Prince George Hotel, Toronto, Ontario, Canada, January 29, 30 and 31, 1918. Gordon C. Keith, Secretary, Toronto, Ont., Canada.

THE CERAMIST'S CORNER

This is a department which appears in The Clay-Worker from time to time dealing with practical and technical matters of especial interest to the ceramist. This month we publish a paper by R. R. Hice which appears in Vol. XIX, Transactions of American Ceramic Society.

RELATION OF FUSING POINT OF ASH TO AVAILABILITY OF COAL FOR BURNING CERAMIC WARES.

By. Richard R. Hice.

THE IMPORTANCE of this fuel supply is not fully appreciated by the manufacturers of clay goods. One may be careful to secure the very highest grades of clays and other materials going into his products—materials which tests show are the best suited for his needs—his methods of working may be the best possible, and his goods when ready for the kiln may be perfect in every way, but he may fall down in the burning of his wares. When we really consider all the facts, we must conclude that fuel is, perhaps, the most important raw material with which the manufacturer of clay goods has to deal.

The general requirements of fuel for ceramic work are essentially the same as for other uses, but with special emphasis laid upon some factors which must, or must not, be present in a clay-burning fuel. We are accustomed to the ordinary proximate analysis of coal, volatile matter, fixed carbon and ash, with a special determination of the sulphur present, and occasionally of the phosphorus. Occasionally we have an ultimate analysis, but usually give it the little attention it deserves.

We generally regard sulphur as the most important impurity present. The bad effects of sulphur cannot be denied, nor the fact that sulphur in many classes of clay goods is especially harmful, yet if the drafts are properly handled quite a high sulphur coal may often be used without any bad effects. Another quality of fuel necessary for good results in a kiln is "reach". It is not only necessary that there be the right quantity of heat generated in a kiln, but it must be so distributed that it reaches all portions of the kiln and the ware in it, and in some classes of ware a uniform character of the kiln gases is essential. If the fuel does not have this "reach," we can still have all the required quantity of heat generated, but the fire boxes will be overheated, a portion of the ware overburned, and some of it underburned. The blame is often charged to the construction of the kiln, and changes are made which have no bearing on the real matter at fault.

The heating value of the fuel is important. If this is too low it is impossible to burn the ware, while a high heating value coal, other factors being the same, means less quantity of fuel and less labor in burning.

For the present purposes we may consider coal as a complex substance, composed of various hydrocarbon compounds, some fixed carbon, earthy materials of various kinds, with other dilutents in the way of hydrogen, oxygen and nitrogen. The earthy materials compose the ash, which may also be considered as a dilutent, but it is much more than this in practice.

The principal constituents of ash are silicon, calcium, magnesium, iron, aluminium, sulphur, oxygen, with varying quantities of the alkalies, and other ingredients to a greater or less degree.

In a study of coal we find that, as we receive it, the ash content consists of three portions. First, there is that portion of the ash which is inherent in the coal substance itself. The plants which formed the coal beds secreted some silica, and small quantities of other earthy materials, and in the passing of the plants into coal this earthy content was necessarily retained. This portion of the ash is, therefore, diffused, more or less regularly, through the coal bed. Secondly, a portion of the ash is found in certain parts of the bed which we cannot call coal proper. This is in the form of mud cracks of various sorts which have become filled with earthy materials. Slate veins, which mark times during the deposition of the coal when the waters were muddy and earthy matter was deposited along with the plant remains. What we designate as bony coal, where there is a large percentage of ash present, often in thin laminæ between laminæ of high grade coal. Third, we have that portion of the ash which results from mining operations. Some of this comes from portions of the roof dropping and becoming mingled with the coal. This is especially the case where the coal is shot from the solid, and the roof shattered so that it flakes off, and these flakes are loaded with the coal. Another portion of the ash due to mining comes from the floor of the mine, especially where the underclay may be soft. This portion may be quite a factor, and is irregular in amount and composition.

It is evident some of these sources of ash may be reduced. The bone coal may not be mined if at the bottom of the bed, or if mined may be thrown out and not loaded. If the slate is of any considerable thickness, it may be thrown aside. Part of the sulphur may be discarded in loading—in some mines where it is in the form of pyrites it is sorted out and sold for making acid. The portion from the roof may be kept down by proper mining methods, and, at times this is an important factor. The portion from the floor can only be reduced by proper mining methods. This portion will vary with the character of the floor, its hardness, composition, smoothness, etc.

The part of the ash due to mining cannot well be reduced except by washing. When run-of-mine coal is used all of this material is embraced in the coal as shipped, and where the slack is removed very often the ash content of the coal is so reduced as to make quite an appreciable reduction from the total average, as well as to make a great change in the relative proportion of the ingredients of the total ash, and of its fusing point.

The ash from these three sources will differ greatly, both chemically and mineralogically, and hence each portion of the total ash will act differently in the process of burning the coal, regardless of the character of the furnace used, the temperature of the furnace, or any other factor in the firing.

If we consider the process of burning coal, not technically, but as we all see it in practice, we learn wherein the ash content of the fuel may be the ruling factor in the selection of any particular coal, or of its rejection. The fuel bed in a furnace consists of several portions or layers. First, immediately over the grate bars there is more or less of a perfect layer of ashes and clinker. The fuel part of this portion of the bed has been exhausted, or it is so covered up by the ashes and clinker that it is not longer available. Over this lies a bed of more or less incandescent carbon—that portion of the coal which remains after the lighter hydrocarbons have been driven off. In this layer of the fuel bed all the ash of the coal which the layer represents is present, except such portion as may have melted and passed down to the underlying ash bed. Overlying this incandescent bed is a layer which varies from raw coal on the top to the character of the incandescent carbon layer.

When fresh coal is placed on the fire bed the first action is the heating up of the cold fuel by the heat of the lower incandescent carbon zone, or of the overlying, fresher fuel. This action of course tends to lower the temperature of the fire box. When the fresh coal is sufficiently heated up, the lightest hydrocarbons present are dissociated and driven off. If there should be no free oxygen present the fire box will practically be a retort, and this portion of the fuel would be called gas and under ordinary conditions would pass up the chimney and be lost. As the temperature of the fresh coal increases, heavier and heavier hydrocarbons are driven off, until only the ash and the fixed carbon remain. In a fire box the gases thus driven off come into contact with air which has found its way upward through the lower portions of the fuel bed. In passing through the bed, the air is heated, and coming into intimate contact with the fresh gases unites with them, burning wherever the proper mixture of gas and air may take place. Under ideal conditions, with the proper draft, the last of the gases would be consumed just as the products of combustion leave the kiln.

The inflow of air through the fuel bed is most important. If there is just sufficient air passing through the grate bars and the overlying ash and clinker to supply the wants of the fixed carbon portion of the fuel bed, there will not be any oxygen in the kiln to combine with the gases set free from the fresher coal. In practice this is never the case at least not completely so.

The ash is left in the fire box, on the grate bars or on the top of the ashes forming the support of the fuel bed. The upper portion of the ash from the burning coal is at the temperature of the lower portion of the fuel bed. Here the fixed carbon is being consumed, and with its disappearance the particles of ash come into closer and ever closer contact. Now if the ash, which is of such varying composition both chemically and mineralogically, is of such character that its fusing point is higher than the temperature of the fire box, the ash remains an unaltered, "dry," and loose mass of earthy matter. In such condition there is free passage for air through it with but little friction or obstruction, and in such case there is ample air passing through the fuel bed, in excess of that needed in the fire box itself, to burn the free hydrocarbons within the kiln, and the coal has "reach."

If, however, the character of the ash is such that it fuses at or below the temperature of the incandescent portion of the fuel bed, an impure glass is formed, more or less viscous at that temperature, and this glass surrounds portions of the coal and prevents its combustion. This partly fused mass forms a more or less continuous body over the bottom of the fire box and prevents free access of air to the fuel which not only cuts off thereby air needed to consume the free hydrocarbons in the kiln, but may prevent good combustion in the fire box itself. This action of the ash is very often the most important factor in a coal, and one that is really neglected in most cases.

The subject of coal supply is at all times important, for when using coal we are always subject to a change in the source of supply, if for no other reason than the working out of old mines. With the passing of natural gas it is especially important. Of late years it has been drilled into us that we should buy our coal on the basis of its thermal value. This may be all right for some uses. I know of coals which were most efficient when burned in the locomotive, but which fell down utterly in the brick kiln. There was no difference in the heating value of the coal, but the difference was in the temperature of the fire box. We can get no information from a chemical analysis of the coal, unless in abnormal cases, for the relation of a chemical analysis of the ash of a coal has the same relation to the fusing point that an analysis of a clay has to its point of failure, and that is usually none. The fusing point of the ash must be directly determined in each case; and as yet there has not been developed any standard method of so doing. What the relation of the fusing point of the ash as found in the laboratory may be that found in practice has not been determined.

It is possible to use a part of a coal deposit which will give a high temperature fusing ash, while the remaining portion of the bed, perhaps not a foot in thickness, will so alter the average ash content, both in quantity and quality, as to render the use of the entire coal impossible. Similar conditions exist as to the sulphur content. It has long been known that often the lower foot or eighteen inches of portions of the Pittsburgh coal carries so much sulphur as to render the use of the whole bed impossible for metallurgical coke.

To return to the fire box. It is true the rate of combustion depends upon the air supply to the fuel in the furnace. We generally measure this by the difference in draft pressure across the fuel bed. This measure may be correct, if all other conditions are the same, but if the rate of flow of the air through the grate and fuel bed varies by reasons of obstructions, the draft readings do not give comparative results. Such obstructions may vary with the thickness of the fuel bed itself, with the character of the coal as regards its size, and more especially as regards the amount of ash on the grate bars, the portion of the ash which is fused, and the proportion of the grate bars covered or obstructed by this fused clinker.

Ash may fuse at as low a temperature as 2000° F., while with other coals the fusing point may be over 3000° F. It needs no argument to show that a smaller quantity of total ash may give a much greater amount of fused material in fire boxes of equal temperatures, than a coal with a higher percentage of ash. It is equally obvious that a small quantity of low fusing ash, which has a correspondingly high degree of fluidity, will run over and obstruct a greater percentage of grate surface, or of the surface of the accumulated ash on the grate bars, than a much larger quantity of a higher fusing ash.

Bailey[1] has pointed out that "the real measure of clinker formation is the difference between the fusing temperature of the ash and the temperature to which the ash is subjected. Thus if an ash with a fusing point of 2000° F. was in a fire box heated to 2100° F. the amount of clinker would be much less than if the temperature of the fire box was 2500° F. If the ash had a fusing point of 2400° F. there would be no clinker in a fire box with a temperature of 2100° F., and at 2500° F., practically the same amount of clinker, the total ash being the same, as in the case of ash fusing at 2000° F. in the 2100° F. fire box. So it is a matter of relative temperatures, which explains the fact that kilns for clay goods will clinker far worse with low-temperature-fusing-ash coals than some other classes of furnaces.

Tests which have been made under boilers distinctly show the advantage of high-temperature-fusing-ash coals. Bailey reports the testing of two coals where the B. t. u. and ash were practically the same, but the fusing temperature of the ash in the one was 2750° F. and in the other but 2390° F. The conditions of the test were as nearly the same as it was possible to make them. The tests showed that with the high-temperature-fusing-ash coal, with a draft of 0.22 inches, there was no difficulty in maintaining the steam pressure, while with the lower-temperature-fusing-ash coal, with a draft of 0.26

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[1] Paper read before the Ohio Society of Mechanical, Electrical and Steam Engineers, Nov. 18, 1911.

inches, there was an average lower steam pressure of five pounds, and four percent less horse power was developed.

The total amount of ash in the two coals was practically the same, but with the high-temperature-fusing-ash coal there was but 804 pounds of refuse cleaned from the grate bars (much of which was slate) and 1101 pounds from the ash pit, while with the lower-temperature-fusing-ash coal 1365 pounds of refuse were taken from the grate bars and 824 pounds from the ash pit. The clogging of the draft by the difference in the amount of accumulated material on the grate bars is obvious.

An examination of the material on the grate bars showed that but 20 percent of the high-temperature-fusing-ash was clinker, while over 53 percent of the low fusing temperature ash was clinker, there being but 224 pounds from the one coal as compared with 746 pounds of the other. A further study of the size of the clinker showed that where there was 22 square feet of grate surface obstructed in the one case there were 79 square feet obstructed in the other. The actual falling off in efficiency of the lower-temperature-fusing-ash coal as compared with the other, at the end of 18 hours firing, was 25 percent.

These facts are especially pertinent to the clay industry. Here we want, if anything, increasing efficiency. In kilns for burning clay wares the draft is limited, and at the same time it is necessary there be no lagging in the flow of the products of combustion through the kiln. It is thus clear that the clay industry requires a coal where the fusing point of the ash is high—the higher the better.

How is a proper coal to be secured? In the final analysis this is the question to be solved. As before said, a chemical analysis of a coal will not determine the fusing point of the ash, nor will an analysis of the ash itself do so. The elements present in the ash are silica, lime, magnesia, iron, alumina, sulphur, oxygen and other elements in small quantities as accidentals. The exact composition is greatly affected by the preparation the coal gets at the mine. It is supposed that the pyrites, slate, dirt, bone coal, etc., are thrown out in the mining. It is needless to say this is not done as fully as is supposed nor as paid for by the operator. It is also evident that in run of mine coal the portion of the underclay and roof which gets into the coal is not removed. It is equally evident that this source of ash varies greatly with the character of the floor and the mining practice.

It is well known that Illinois coals, for example, contain from 9 percent to 10.5 percent of ash, that is, when a mine sample is taken under standard conditions. Some of this is supposed to be thrown out in mining, so that the ash in run of mine coal should be less than 10 percent. As a fact, however, the result of extensive study shows the average ash in run of mine coal in Illinois is 15.7 percent, in the lump and in egg it is 13.5 percent, in the nut coal it is 13 percent, in the slack 17.8 percent, and it is only in the best of the washed coals that the ash content runs as low as the determinations made on samples cut from the solid in the mine. This fact shows the necessity of having more knowledge than an analysis furnished by the operator of samples cut in the standard manner.

It is a generally prevailing idea that sulphur is the cause of clinker trouble. Where the sulphur exists as pyrites, the iron present may act as a flux and cause a reduction in the fusing temperature of the ash, but, however, much the greater portion of the sulphur itself burns and leaves the furnace as a gas. There does not appear to be any relation between the sulphur content of the coal and the quantity of the clinker, or the fusing point of the ash, and one can hardly see how such could be the case.

The quantity of the ash bears no relation to the fusing temperature, and there is no apparent reason why we should so think, neither is the color of the ash an indication of the fusing properties.

It is possible, however, to buy coal with at least a relatively high fusing temperature ash. To do this intelligently it is necessary not only that the fusing point of the ash in the coal as sampled in the mine be determined, but we must know the character of the coal in this respect as received. We must know also the temperature of the fire box, and how it varies from time to time during the burn. Again, the mine should be examined to determine the uniformity of the ash content and the uniformity of the behavior of the ash, to know if certain portions of the bed should be left in mining, to learn what portion of the ash is due to mining operations, as distinguished from the ash inherent in the coal. These are but some of the factors to be determined. They cannot be determined by the purchaser sending a sample taken at random from a car to some chemist for analysis. Few coal laboratories pay any attention to the fusing point of the ash, and will not until compelled to do so.

Samples should in all cases be taken by someone conversant with the proper manner of taking coal samples, both in the mine, and in the car or stock pile. They should be taken by someone familiar with mining practices and with the peculiarities of the bed being worked. Preferably, such work should be done by some bureau or laboratory which would not represent any one particular manufacturer, but was an organization which would take up the study in the interest of all. Such an organization would be of value to the manufacturer in case of disputes, for it would have a standing with the coal operator which no individual manufacturer or commercial analyst employed by the manufacturer could possibly have. The expense involved would be small in comparison to the benefits derived.

TWENTIETH ANNUAL MEETING OF THE AMERICAN CERAMIC SOCIETY, TO BE HELD AT INDIANAPOLIS, INDIANA, FEBRUARY 11-12-13, 1918.

To the Members:

Your Board of Trustees has decided to meet at Indianapolis on the above dates. The annual meeting of the N. B. M. A. will be held the latter portion of the same week, and the previous pleasant relations are thereby assured of continuance.

In the interests of the Society and the advance of Ceramics, it is vitally important that every member shall be present at this annual meeting. A number of vitally important matters concerning the future of the society are likely to be brought up for consideration at this meeting, and every member should be prepared to cast his vote.

Regarding the papers for presentation at this meeting, the secretary urges that this be immediately considered and that you report to the secretary's office at the earliest possible moment, on the attached blank, the information requested. Every industry connected with the society should make a special effort to come forward this year with high grade contributions. At no time in the history of the society has up-to-date information on ceramics been so much in demand, or so readily utilized by the industries. Do not be content to come and listen. Send the secretary notice of your proposed attendance at the Indianapolis meeting, and also a statement of the subject upon which you will present a paper or lead a discussion. If you can furnish your paper to the secretary's office a sufficient time in advance of the meeting, an effort will be made to secure a thorough discussion of same by distribution of pre-convention copies.

The success of the annual convention depends upon every individual member doing his share. Announce your intention of so doing immediately.

For the Society,
Columbus, Ohio.
A. S. WATTS,
Secretary pro tem.

HE "QUEERED" HIS OWN JOB.

DID YOU EVER hear of a sales manager spoiling his own job by doing this—

By "butting-in" on the designers, and helping them to build a machine so good that sales come in practically unsolicited?

That's what A. C. Vicary did. They call him the "Sales Manager" at the Ball Engine Company, where they build the Erie Shovel.

But the sales manage themselves—because buyers have been quick to see what they get for their money when they buy the Erie.

Mr. Vicary didn't officially design the Erie Shovel—he gives the credit to the Chief Engineer of The Ball Engine Company, E. J. Armstrong, and his corps of able assistants. But it was Vicary who started the thing. He kept awake nights figuring out just what a revolving shovel could be and ought to be. A better shovel through and through; far more powerful than any three-quarter-yard machines were being built; not only more reliable, but quicker acting and easier to operate speedily. He KNEW that these features could be attained at practically no more cost than that of the existing machines.

It was back in 1912 that the first Erie was designed. Mr. Vicary saw his dream come true—and once the Erie Shovel was a reality, it succeeded so tremendously that its builders had to turn all their energies to keeping up with the demand.

Four hundred Eries are now in service. In 1917 there will be more Eries sold than all other makes of three-quarter-yard shovels combined. The photo shows Mr. Vicary enjoying his favorite pastime—watching Erie Shovels go out into the world to add to the Erie reputation.

At Erie they ship shovels four at a time, as they build them in lots, on the interchangeable duplicate plan. It is the first application of modern manufacturing methods to the Steam Shovel business—and it is going strong! There isn't a machine made that hasn't a few boosters—but if you talk to owners of Erie Shovels, you will know what Mr. Vicary means when he says: "Every Erie owner is an enthusiastic booster!"

A. C. Vicary, Sales Manager of the Ball Engine Co., Erie, Pa., Takes Delight in Watching the Departure of Trainloads of Eries.

SAFER THAN RESIDENCE SECTIONS.

The Federal Government has recognized the danger of the wooden shingle roof in its cantonment construction. These buildings are built mainly of wood, but no wooden shingles are to be used for roofs. Instead, the Government has prescribed the use of prepared roofing, approved by the Underwriters Laboratories. These wooden cities where the soldiers are to be housed are comparable to the frame residence sections of a city. They are very light and of inflammable construction, but with the elimination of the wooden shingle roof, these cantonments were made safer against a sweeping conflagration than the frame residence sections of the cities.—Exchange.

Complaints are heard of the scarcity of help in practically all parts of the country, and of late there has also been reported some scarcity of cars, all of which tends to hamper the progress of industry.

CORRESPONDENCE.

THESE COLUMNS ARE OPEN TO ALL. THE FULL NAME AND ADDRESS IS REQUIRED, BUT WILL NOT BE PUBLISHED EXCEPT WHEN PERMISSION IS GIVEN. THOSE DESIRING TO COMMUNICATE PRIVATELY WITH ANY CORRESPONDENT WHOSE FULL NAME IS NOT GIVEN CAN DO SO BY ADDRESSING LETTERS CARE OF CLAY-WORKER.

Red Slip Clay Wanted.

Editor The Clay-Worker:

The undersigned is looking for a red slip clay or shale which will vitrify and burn to a dark red shade at 1800° F. Would be pleased to hear from anyone possessing such a material. Advise W. P. Grath, 714 Wright building, St. Louis, Mo. Very truly yours,

St. Louis, Mo. W. P. GRATH, President.

Capital City Company Opens New Sales Office.

Editor The Clay-Worker:

We are pleased to advise you that we have opened a branch sales office in Davenport, and we would be pleased to have you enter our subscription for The Clay-Worker to be sent to the Capital Clay Company, First National Bank building, Davenport, Iowa, rendering your bill for same to this office. Very truly yours,

J. L. BUCKLEY,
Des Moines, Iowa. General Manager Capital Clay Co.

Wants Information in Regard to Making Fire Brick.

Editor The Clay-Worker:

We would like to ask for some information in regard to the manufacture of fire brick. We are considering changing our plant to fire brick and would like to know what is the best method for making same. We have a stiff mud machine, but on dry press and other methods.

We would like to get right on this matter and we feel that you are familiar with the subject. Would you kindly give us some idea of the general opinion of brickmakers. Thanking you kindly for a reply, we beg to remain,

Yours very truly,
GUSTAVE RISACHER, Secretary-Treasurer,
The Loogootee Face Brick and Tile Co.
Loogootee, Ind.

Los Angeles Brick Manufacturers' Outfit Curtailed.

Editor The Clay-Worker:

Replying to your inquiry of recent date relative to the building operations in our section, and the effect of the war upon building activities, will say that much to the disappointment of the burnt clay manufacturers in this section, we are suffering from lack of business. War demands have greatly advanced other lines of production, notably all the lines of agriculture and mining, and the state as a whole is receiving large returns from our varied industries.

Owing to the increased price of fuel and labor it has become necessary that the price of all burned clay ware advance. The price of common building brick in this locality is now $8 per M. We notice by comparison that this is considerably lower than in other sections of the country. Activities in all other lines of building material have likewise been affected and prices have advanced, however, we are anticipating a marked revival of business after hostilities have ceased.

Yours respectfully,
Los Angeles, Cal. SIMONS BRICK CO.

Wyoming Plant Places Order for Equipment.

Editor The Clay-Worker:

You will probably be interested to know that the Casper Brick & Tile Co., Casper, Wyo., placed their order today for equipment for their new plant through the Geijsbeeg Engineering Company, of Portland, Ore. The order includes the following: Two 9-foot Standard Eagle dry presses, one special Premier Fate machine, one size B piano wire screen, 36x60; one bucket elevator, one Columbus automatic feeder, one Bensing side-cut cutter, one Bensing hollow brick end cutter, one Bensing hollow block cutter, four "Guilder" pallet platform cars, and two transfer cars. All of the machinery is to be on the ground and set up by March 1, 1918.

Yours truly,
H. F. GOSS, Secretary and Manager.
Casper, Wyo., November 12, 1917.

Iowa Clayworkers Handicapped by Car Shortage.

Editor The Clay-Worker:

The general conditions in the Iowa brick and clay field remain just about the same as they have been for the last few months. All through the trade a feeling of pessimism prevails. This originates not with the selling end, for business in this particular is entirely satisfactory, but in the producing end. There are three separate and distinct features which tend to this pessimistic frame of mind which seems to be general among the producers in Iowa. First, and of longest standing, is the difficulty which has been in evidence for several months to secure a sufficient number of men to operate the plants. A large number of men in the Iowa clay industry enlisted in the opening months of the war, and when the draft came many others were called to the colors. This labor shortage in itself was sufficient to cause several Iowa plants to announce a shutdown. Now the car shortage has hit the industry and promises to be as much of a problem as the labor shortage. The shortage is most acute in the Mason City district, which is the most important clay field in the State. There are six plants of considerable size at Mason City, and when it is shown that a single one of these six plants ship 6,000 carloads a year, and all the plants use probably seventy-five cars a day, it is easy to see what the car shortage will mean to the industry there.

At the monthly meeting of the Permanent Building Society held at Fort Dodge, November 1, a committee was appointed to take up with government officials the matter of having cars for the clay products placed on the favored list by the Government. The clay producers say that Iowa fields can be made much more productive through the use of drainage tile, and that for this reason the matter should be favorably considered by the food commissioners. They hope in this way to secure relief from the congested conditions which now prevail.

The third shortage which is perplexing the clay men is a coal famine. Iowa has been up against it for the past month. In practically all cases coal dealers have limited the shipments and in some cases it has been absolutely impossible to make deliveries.

At the present writing it seems that at least ten or twelve plants of considerable size in Iowa will close until relief is secured.

The Western Drain Tile Association, which was recently organized by the Permanent Building Society, has met a most hearty reception with the clay producers of Iowa. The Southeastern Iowa Producers at a meeting in Ottumwa, late in October, received the new movement warmly and almost to a man took membership. At the Fort Dodge meeting on November 1 a number of producers in north central Iowa, who have not been members, joined heartily in the movement. The Western Drain Tile Association is about ready to start an advertising campaign of considerable magnitude which is expected to bring most favorable results. W. H. MORE.

North Dakota Firm Wants Tests Made of Shale.

Editor The Clay-Worker:

We are figuring on erecting a plant for the manufacture of building brick. We have a deposit of blue shale and rock sand, and we would like to send some of our material to some clay expert who could make tests and advise us as to the product for which material is best suited. Would like to get in communication with responsible people who make such work their business.

Yours very truly,
W. W. LYNESS, Secretary,
National Briquetting Co.

Fessenden, N. Dak.

VEST POCKET INFORMATION ON THE DU PONT COMPANIES.

There has just been issued a handy little booklet which contains a list of all the products manufactured by the E. I. du Pont de Nemours and Associated Companies, namely Du Pont Chemical Works, Du Pont Fabrikoid Company, The Arlington Company and Harrisons, Inc.

Of course this booklet does not indicate who uses the products or how used, as does the Du Pont Products Book, but it will no doubt prove of interest as well as of value to many mercantile and industrial men. It is small enough to fit in a busy man's pocket. It will be sent upon application to the home office at Wilmington, Del. See ad on page 477.

AMERICAN AND JAPANESE CERAMIC ART IDEAS.

AT A RECENT EXHIBIT for sale purposes in New York a large number of products of clay working in Japan were shown, including some very expensive porcelains. Usually these articles are exhibited only in small lots, or a few pieces owned by some collector are available for examination. The result is that one's impressions of Japanese products of this character may be more or less hazy.

Furthermore, sometimes it is essential to compare what is made at home with what is produced in a foreign country to acquire a satisfactory impression of either. While Japanese vases and similar works of art are marvels of craftsmanship, the decorations, in some instances, possessing wonderful merit, it must be confessed that the reproduction of animals or human beings are not satisfactory, if the element of beauty is considered.

Alongside of this display of Japanese porcelains was another of those made in France, and some in America. Both the American-made articles and the French were objects of beauty. They were all pleasant to look upon and all more or less artistic in their character. But Japan makers seem to develop only the grotesque in attempting anything of this sort.

Whether the influences which result in such work are fundamental, or whether they purposely adopt the grotesque for its advertising value, does not appear. A nation which bases so much of its art upon the beautiful cherry blossom can hardly be accused of lacking appreciation of beauty. But notwithstanding this, their reproductions of men and animals are far from satisfactory to the average Occidental, excepting as curiosities.

Comparisons like this should encourage the American designer and manufacturer of works of this sort in clay. Beauty is, after all, the real reason for the possession of such works. As if the designer and maker can reproduce beauty he is reasonably sure of a hearing. The collector wants beauty, though he will buy the grotesque. Vases decorated by intricate inlaid work are things of beauty and their value is high, as it should be, but aside from such work as this the American maker has nothing to fear.

Burned clay is capable of wondrous development in art never yet appreciated. Fortunately, many Americans understand this and are working along the right lines in attempting to express themselves in some form of burned clay. Notable works have come from studios of American artists in the past few years and more are destined to come from them as they become more accustomed to the possibilities of their medium. An opportunity to closely compare the productions of the artists of the two countries doesn't come often and this one proved of educational value beyond its intention.

Very many visitors spoke of the contrast and agreed that such differences should lead to a wider appreciation of the ceramic art of America.

OBITUARY.

Claude Knight, an employe of the National Drain Tile Company at Hillsdale, Ind., was ground to death in one of the clay pans. Together with three other men, he was working overtime cleaning out the clay pans. The other men stepped out and Knight spied a place that needed further attention. He stepped back into the pan. A clutch broke that was holding the pan, and Knight was thrown headlong into the cogs on the crusher. The machinery was stopped in a second, but it was too late, life was extinct. His body was ground to pieces and the largest section that could be found was his hand.

Harry F. Bigler, one of the pioneer brick manufacturers of Clearfield, Pa., died at Atlantic City recently, where he had gone because of ill health. Up to the time of the consolidation of the Clearfield Fire Brick Company with the Harbison-Walker Refractories Company, in 1902, Mr. Bigler was president of the Clearfield Fire Brick Company. Since that time he has been an active director in the Harbison-Walker Refractories Company. He was a member of the board of directors of the County National Bank, Clearfield Water Company, and active in a number of other enterprises.

George H. Cutter, of Sheridan, Wyo., lost his life October 28 in an automobile accident during a snow storm which was raging in that vicinity. Mr. Cutter was driving from his ranch to Sheridan, and several people who passed observed that he seemed to be having some trouble with his engine. Later in the day he was found dead under his overturned machine in a ravine just off the main highway. Mr. Cutter was seventy-one years old, and had been engaged in brickmaking nearly all his life, first in Canada and later in Wyoming, where he had lived since 1885. He organized the Sheridan Pressed Brick Company in 1905 and sold his interest in same two years ago, since which time he had been taking a well-earned rest, devoting most of his time to ranching.

Hook onto all the labor-saving devices that you can make good use of to conserve and supplement the short supply of man power.

FRENCH LICK SPRINGS AS USUAL.

Sixth Annual Meeting American Face Brick Association to be Held at French Lick Springs Hotel, December 12, 13 and 14.

HAVING SAMPLED the brand of Hoosier hospitality handed out by Thomas Taggart at his famous health resort, at former annual meetings the Executive Committee of the A. F. B. A., has decreed that the members of that association will convene there December 12 in annual conference. Secretary Hollowell makes the following announcement:

The French Lick Springs Hotel has made a flat rate of $6.00 per day for one person in room or $10.00 per day for two persons in room, whether or not room has bath attached. Account the quiet season at French Lick in December, the hotel believes they will have sufficient rooms with bath to accommodate every one who may come to the meeting.

The program is to be characterized by the discussion of timely topics, and the sessions on the afternoon of the 12th and mornings of the 13th and 14th will be cut short as possible. Promotion, Excess Profits Tax Law, Government Emergency Construction, the Adoption of Standards and other interesting subjects will be given attention.

On the afternoon of December 13th, it is planned to have round table conferences of manufacturers from the various producing districts. This was a very successful venture last year, and Secretary Hollowell believes it will be quite an incentive for attendance by all.

The Face Brick Dealers' Association will meet at the same time and place, as usual, and it is anticipated that the attendance will include practically all of those interested in the manufacture and sale of face brick throughout the Central States. The meeting affords a rare opportunity for a happy combination of business and pleasure. French Lick by reason of its natural advantages, central location, the value of its waters and baths and facilities for the comfort, health and entertainment of its patrons, has become widely and favorably known as America's greatest health resort.

The springs are in a beautiful valley of southern Indiana, forty miles from the center of population of the United States, and amid the most charming and picturesque surroundings. Noble ranges of hills rear their summits on either hand, while long vistas of valley, grassy meadow, upland and billowy forest stretch away to the horizon, forming an ideal setting for this most delightful of American resorts. Because of its rugged nature, the country retains much of its primitive wildness, the beauty of which is made easily accessible by good roads for motoring and horseback riding. The domain of the Springs Company comprises two thousand acres, including the springs, lawns, golf course, gardens, dairy farm and surrounding hills.

As will be seen by the excellent illustration on page 468 of this issue and accompanying interior views, the Springs Hotel is an imposing six-story fire-proof structure of buff brick, and contains 500 rooms with all the modern conveniences of the best city hotels. The recent addition, because of its perfect appointments is known as the addition de luxe. The commodious lobby, luxuriously decorated and furnished as a spacious lounging room is cheerful and inviting, and now quite familiar to the rank and file of the A. F. B. A. Prince Pluto awaits the arrival of the delegates, for each and all of whom a warm welcome is assured. He is wise who requests reservation at an early date. A beautifully illustrated book, giving full particulars as to the many attractions of French Lick and how to get there, has recently been issued. It contains a large birdseye view of the hotel and its environs, including its famous golf course. Copy can be had for the asking. Address Thomas D. Taggart, manager, French Lick, Indiana.

A Glimpse of the Park Surrounding Hotel.

Pluto Spring House, French Lick.

OIL PRODUCTION AND CONSUMPTION.

One of the big factors in industrial life as well as in the affairs of the war is found in the production and consumption of oil. The average daily draft on the stocks of petroleum in July, 1917, was 47,000 barrels of 42 gallons each. Taking the first seven months of the year the average daily consumption was 35,000 barrels.

It is but little wonder that in the face of this there is considerable activity in the oil fields and much new development, because oil is something that in this day of rapid moving is consumed practically as fast as it is produced. That is what may seem an immense stock of oil on hand. The total stock on hands in July of 1917 according to the United States Geological Survey reports was 166,607,000 barrels. This looks like a large quantity till we turn back and note that during the year 1916 the consumption of oil was 312,438,599 barrels. Stated another way, there is only enough oil in this immense stock to serve the needs of the country a little better than six months. So it would not be long if the supply of oil production was seriously curtailed until there would be a great shortage of oil and a country-wide hardship as a result.

EXPORT MACHINERY POSSIBILITIES.

IN THE CLAY-WORKER for September there was quite an article devoted to the subject of selling products in the Latin-American countries and the possibilities of development of the markets. There is room for developing a much more extensive trade in several of the clay products, lines, but the biggest field of opportunities is for the development of a market for clayworking machinery, including tools and supplies for laying brick, as well as machinery and equipment for making it.

The export trade in brick proper will in the main be limited to fire brick and fancy building brick, glazed tile, etc., products that can stand the cost of the long haul. Common building brick are limited in territorial distribution because of the freight cost involved, which makes an opportunity for the development of brick making in those Latin-American countries that are now prospering and will look more than ever to this country for their supplies in the future.

Our total export trade in clay products for the fiscal year ending June, 1917, was $6,162,021. The biggest item, a little more than half the total of this, was fire brick, and a fair share of this went to Latin-American countries, especially to the sugar-making industries in the West Indies. Moreover, we will continue to supply a large out-going trade in fire clay products.

Next to fire clay the most important item is earthenware, stoneware and chinaware, the two amounting to more than a million dollars last year. These pottery items, including also sanitary ware, hold possibilities for a great future development in the Latin-American countries. Also, there is a chance to do more business in face brick and in the enameled brick and tile, especially for those plants which are located near tide-water.

The big field of possibilities, however, is the clayworking machinery and in machinery and supplies generally. When the war ends, we may expect an enormous demand for clayworking machinery for many of the warring nations of Europe, because the scarcity of help will make a necessity for labor-saving machinery. Therefore, since we are the greatest builders of labor-saving machinery in the world, there will be a natural turning to this country for the first supply, at least. Later the European countries may pattern after the designs here and develop their own labor-saving machinery. They are likely to look to this country first, however, and to continue buying many of our machines.

Meantime there is the big field of Latin-American countries which offers broadening opportunities for two reasons. One is that they formerly obtained most of their clayworking machinery from Germany and from England, or we might say, from Europe generally. This source of supply being cut off, they are naturally turning to the United States, which makes one opportunity. The other is in the fact that the Latin-American countries are beginning an era of development and of more permanent pretentious building, which will call, in the natural course of events, for the development of brick yards and clayworking plants of all kinds to supply the needs.

It is this Latin-American territory, therefore, which makes the big field for the present time and will continue as an interesting field, even when the war ends, for the marketing of clayworking machinery and supplies of all kinds.

Some idea of the development going on down there and the increase of trade in iron and steel manufacture may be had from the fact that Mexico, Cuba and Brazil bought among them $3,000,000 worth of locomotives last year and they also bought extensively of other machinery. For example, we sold $11,000,000 worth of sugar mill machinery during the year, we sold wrought iron pipes and fittings to the total of more than $16,000,000, or twice what was sold the previous year, and three times our sales before the war period. In addition to this, we sold $5,000,000 worth of cast iron pipe and fittings, and similar increases are shown in practically all of our metal lines. Tools, including axes, hammers, saws, shovels and spades, have doubled in the quantity of exports during the past year, and have multiplied several times during the war period. And while part of these go to the warring nations, an ever-increasing proportion also goes to the Latin-American countries.

BUSINESS AS USUAL AT GALESBURG.

THE paving brick metropolis of Illinois is prosperous and busy these days. All of the many manufacturing establishments there are running to capacity, it would seem. At least that is true of the great pioneer plants of the Purington Paving Brick Company and the Frost Manufacturing Company, two long established concerns which have carried the name and fame of Galesburg throughout the length and breadth of the land, and foreign countries ,too, for Frost boilers, Frost engines, and Frost dry pans have been installed in almost every civilized country under the sun.

During the past summer and fall season, the Frost Manufacturing Company have been unusually busy, turning out their Standard Scotch marine boilers for the National government. Of late there has been an increased demand for Frost dry pans, which they have standardized and which are now equipped when so desired with motor drives. Frost pans have been used exclusively in the plants of the Purington Paving Brick Company, where eight of them do daily service, grinding shale for 100,000,000 brick annually. They also make a wet pan which has proven very satisfactory in the manufacture of fire brick, etc. A cut of the Standard Frost pan is shown on page 497.

The Purington Paving Brick Company.

Notwithstanding the car shortage and difficulty in securing coal, to say nothing of the scarcity of labor, the great plants of the Purington Paving Brick Company have been operated to capacity the past season, which has been a strenuous one for the management, but they have been equal to the situation. The demand for Purington pavers has been equal to the output, the present stock piles are not so large as they were last season at this time.

About one-fourth of their total output this past year has been vitrified, vertical fibre brick for which there is a large demand in the western and northwestern sections. These brick laid on the flat with an asphalt filler makes an ideal pavement. They recently booked an order for pavers for one of the approaches to Camp Dodge at Des Moines, Iowa, about three miles in length, which it is anticipated will prove a very popular thoroughfare.

The general manager of the P. P. B. Co., W. G. D. Orr, had some amusing experiences recently in the Liberty Bond campaign. With characteristic energy he made a canvass among the employes of the plant and was surprised to have some of the common laborers subscribe and pay cash for several hundred dollars worth of bonds. There are quite a number of foreigners among the employes. One of these when asked if he wanted to buy a Liberty Bond said, No, he did not, he had given one boy to the service, and that was enough.

Another of the foreigners when he was told this, said in language more forceful than elegant, "What does the blankyty blank mean, our boys are there too, and he wants us to furnish the means to clothe and feed his boy. I'll see him about that," and he did, with the result that the objector came into the office the following day, and said shamefacedly that he had not thought about the feeding and clothing of the boy. That he did not ask any man to contribute to the support of his boy and subscribed $300, planking down the cash. He added that if more was needed, it would be forthcoming. Almost every employe was numbered among the Liberty Bond subscribers, proving that at heart they are loyal American citizens, though from their looks and speech, they seem to be foreigners.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T, A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVIII. NOVEMBER, 1917. No. 5.

My Country, Right or Wrong—My Country!

CURRENT COMMENT.

Coal prices are cold propositions these days.

* * *

Sharing profits is fair, but giving all the profits in wage increases hurts.

* * *

Our boys are now on the firing line and our duty at home is to back them up as a solid unit.

* * *

A good use of boiler covering and insulating material on steam pipes will help save coal at the power plant.

* * *

Note change of date of N. B. M. A. Convention to the second week in February, as per official announcement on page 439.

* * *

Whatever we may develop in the way of political lines and issues, let us not for a moment get away from the fact that the war is the dominant issue of the day, and on this we should have neither political division nor interference of any kind. Let us show the world and furnish for history a shining example of a people united on the main issue of humanity today.

* * *

In addition to fire clay another line of clay products that should be boosted and gain in volume of business this winter is drain tile.

* * *

Our pottery trade with the Latin American countries is growing nicely and carrying with it some other interesting items in clay products.

* * *

Everything else has been reported as scarce so we may naturally expect the turkey crop to come up short, and those that are eatable to be roosting high.

* * *

In going into winter quarters with the plant a little extra time given to cleaning up machinery and coating with oil or paint will effect a saving and is worth while.

* * *

It ought to be a great Thanksgiving season with the farmers of the country because they have not only made big crops but the crops have brought the highest price on record.

* * *

We seem to be "over the top" now in the wild prices for the necessities of life, and can breathe a sigh of relief while taking up the task ahead of steadying things down to a fair basis all around.

* * *

If you are starting in to remodel or reconstruct equipment about your plant make it a point to include mechanical handling devices whereever possible to reduce the amount of hand labor involved.

* * *

Perhaps some of the brickmakers of the country will find it advantageous to return to wood again this winter. It is well to remember, however, that it takes a cord and a half to two cords of wood to equal a ton of coal.

* * *

An extra cent on postage is plainly a taxing proposition, but it is handed to all alike, whereas in the taxing of publications there are some discriminating clauses which will make trouble and the worst of it, is they seem to be without excuse.

THE SPIRIT OF THE PILGRIMS.

It may seem a far cry from the fourth Thursday in this year of 1917 to the day when Thanksgiving was originated by the Pilgrims of New England in 1621, yet there is such a close relation of sentiment that one can almost feel the spirit of the Pilgrims abroad in the land today. The thing which caused them to venture into the wilds of this new country was to seek a place for spiritual freedom. They endured many hardships for the sake of establishing religious liberty, whereas today we are undertaking many hardships to make the world safe for democracy. We are in the attitude of going back to the old countries to fight for substantially the same spirit which induced our forefathers to come to this country, and nothing is more impressive of the strength and perseverence of the spirit of liberty than a consideration of it in this light, the light of the spirit of the Pilgrims, which brought them over here, and is carrying us back today to wage a war for the liberty of the world. Moreover to clothe and fit this sentiment in its proper Thanksgiving garb our country today is placed in the attitude of feeding the world from the abundant crops produced from the ground through the efforts and resourcefulness of the people here aided by a kindly Providence.

Therefore the fourth Thursday of this November should be a memorable one in the annals of our history.

GOOD THINGS FROM THE WAR.

The magazines and newspapers of the country are actively casting about among themselves these days to locate and enumerate the many blessings that may come to us as a result of participating in the great war, and conspicuous among these is improvement in transportation. This includes not only good roads, but also a revival of interest in water way transportation. We have a very important system of inland water ways that have been neglected in a measure because of our great system of railways. But now the needs of the day which have overtaxed the railroads have awakened such an interest in water-way transportation that out of it all we are getting promise of real improvement and development in this connection. Already the government is proposing to cooperate in a practical manner and about all we need further is an arousing of the people that we may keep up enough interest in using our water-ways to make them worth while. The clay working industry is one that should profit in a great measure from improvement and an enlarged use of our waterway transportation because it has a heavy freight in which lower rates will prove a factor of importance in widening distribution and encouraging a larger use of brick and clay products.

In this connection it is well to bear in mind that the fourteenth annual convention of the National Rivers and Harbors Congress will be held on Wednesday, Thursday and Friday, 5, 6, and 7 of December in the auditorium of the New National Museum, Washington, D. C. The purpose of this meeting is to plan how the government, the cities and the people may most effectively cooperate to use the water-ways of the country.

AMERICAN CERAMIC SOCIETY.

The Clay-Worker feels moved at the present time to urge more interest in and cooperation with the American Ceramic Society. It is deserving of a larger membership and more hearty support all around. This not only because the American Ceramic Society has an enviable record and has rendered signal service to the industries represented in it, particularly to the clay working industry, but also because at the present time there is more need than ever before for the kind of active research carried on by this organization. War conditions have made necessary a more extensive inquiry into and development of our domestic resources. Also it has put this organization in a position where with the proper support it can stand out conspicuously as a world's leader in this work.

It is the desire therefore to heartily indorse efforts to increase the membership and get more hearty cooperation all around, out of which will naturally come a broader and more effective service on the part of the organization itself. Also there is some special work being undertaken which merits particular attention.

For example, the sub-committee on the raw ceramic materials is proposing to compile a directory of producers of and dealers in raw ceramic materials. The value of such a directory is easily apparent to everyone in the industry, whether a member of the society or not, and we want to bespeak for this effort the hearty cooperation of not only the members of the American Ceramic Society, but of every man in the clayworking industry, whether he has such raw material in the market or not. It is a part of his duty to furnish names of any he may know of who have raw material to offer to the end that we may get out of it all a comprehensive directory of our national resources. The appeal for this cooperation on the part of the trade is being sent out by Arthur S. Watts, secretary pro tem of the American Ceramic Society, 1538 North High street, Columbus, Ohio, and those in a position to help along this good work should immediately communicate with him.

And don't overlook the membership campaign that is being inaugurated. If you are not a member get yourself enrolled for the membership in the class you should belong. If you are already a member, look around you and see who among your neighbors and acquaintances have not heretofore been members, that you can induce to join. Lend a hand and help the cause of the American Ceramic Society along. It is deserving of the earnest and active support of the entire clayworking industry. Ross C. Purdy, of Worcester, Mass., is chairman of the membership committee. The membership committee at a recent meeting mapped out a very elaborate campaign both for a local sectional organization and for membership promotion, suggesting a number of local organization sections, and naming chairmen for quite a string of industrial sub-committees for the membership campaign.

If you haven't heard from one of these, you probably will. Meantime don't wait to hear from them, but, if you are not already a member and active in the work, get in touch with the nearest man to you who is.

TRANSPORTATION TROUBLES LOOM UP.

There is plenty of evidence of trouble ahead in the matter of transportation for brick people and some indication at this writing that in the priority regulations of the government to supply cars for coal and other necessities the hauling of brick for any but some special building purposes may be forbidden.

For example, there was recent steps taken which as reported in the news of the day to forbid the use of open top freight cars on and after November 1 for transportation of material for roads and highways, theater construction and the manufacture of pleasure vehicles, furniture and musical instruments.

Nothing is said about brick, but it shows trouble looming on the horizon of the clayworking industry just the same, because back of it is a general proposition to restrict the shipment of what is termed non-essentials to the end that the railroads may handle promptly coal and war material of all kinds and the things considered essential. New building operations are not among the things considered essential except where building has to do with the war neds, either directly or indirectly, consequently there is every chance that the clayworking industry may be seriously handicapped in transportation facilities by rail, unless, of course, the railroads should be fortunate enough to get caught up on the essentials and have time and rolling stock to spare for other needs. This is a condition to be hoped for but hardly to be expected during the winter period. It looks like a period of trouble for rail transportation.

WAR AND ROADS.

We are reminded by a bulletin of the Lincoln Highway Association that an important measure is pending in Congress providing for the first step toward a Federal road improvement program. It is well for us to keep this fact in mind and also to keep Congress reminded of the need of continuing our good roads work.

There are two important facts which have been emphasized somewhat by war condition in connection with roads. One is that good roads are excellent things for emergencies of this kind, just as a good railway system is en excellent thing, and that we need more good roads to supplement our systems of railroads. The other fact, and the one that perhaps has not yet dawned on the minds of the general public, is that we have learned to think, talk and deal in billions as a result of the present war, to issue bonds and take up enterprises which in peace times would have been considered so stupendous as to be impossible. The war has done much to bring to the front the bigness of this country and to emphasize the fact that there is practically no limit to the possibilities when we once take a notion. This should be of material benefit eventually. When we are through with the war and turn our attention to road building the big sums primarily involved in building a complete system of roads and doing the work right, even to the point of surfacing them with brick, will not be the same interfering handicap it was before the days of war.

We are also reminded that back in 1916 President Henry B. Joy, of the Lincoln Highway Association, presented a plan for a military highway running along the Atlantic coast, the Gulf border and the Pacific coast and Canadian border, an idea which looked very imposing at that time, and at the present time is very impressing because we have become mixed up with war and know more of the war needs in the way of transportation. Also we have developed motor trucking until the future of the cross country roads looks bigger than the railroad business itself.

Measures pending in Congress seems to be a step toward realizing the dream of President Joy and it is well to keep all these things in mind not only that we may continue our road building activities in so far as practical, while the war is going on, but when it over and the men return to the industry we may take up with road building on a greater scale than even was dreamed of before.

YOUR LAD AND MY LAD.

Down toward the deep blue water, marching to throb of drum,
From city street and country lane the lines of khaki come;
The rumbling guns, the sturdy tread, are full of grim appeal,
While rays of western sunshine flash back from burnished steel;
With eager eyes and cheeks aflame the serried ranks advance;
And your dear lad, and my dear lad, are on their way to France.

A sob clings choking in the throat, as file on file sweep by,
Between those cheering multitudes, to where the great ships lie;
The batteries halt, the columns wheel, to clear-toned bugle-call,
With shoulders squared and faces front they stand a khaki wall.
Tears shine on every watcher's cheek, love speaks in every glance;
For your dear lad, and my dear lad, are on their way to France.

Before them, through a mist of years, in soldier buff or blue,
Brave comrades from a thousand fields watch now in proud review;
The same old Flag, the same old Faith—the Freedom of the World—
Spells Duty in those flapping folds above long ranks unfurled.
Strong are the hearts which bear along Democracy's advance,
As your dear lad, and my dear lad, go on their way to France.

The word rings out; a million feet tramp forward on the road,
Along that path of sacrifice o'er which their fathers strode,
With eager eyes and cheeks aflame, with cheers on smiling lips,
These fighting men of '17 move onward to their ships.
Nor even love may hold them back, or halt that stern advance,
As your dear lad, and my dear lad, go on their way to France.

—Randall Parrish, in the Chicago Tribune.

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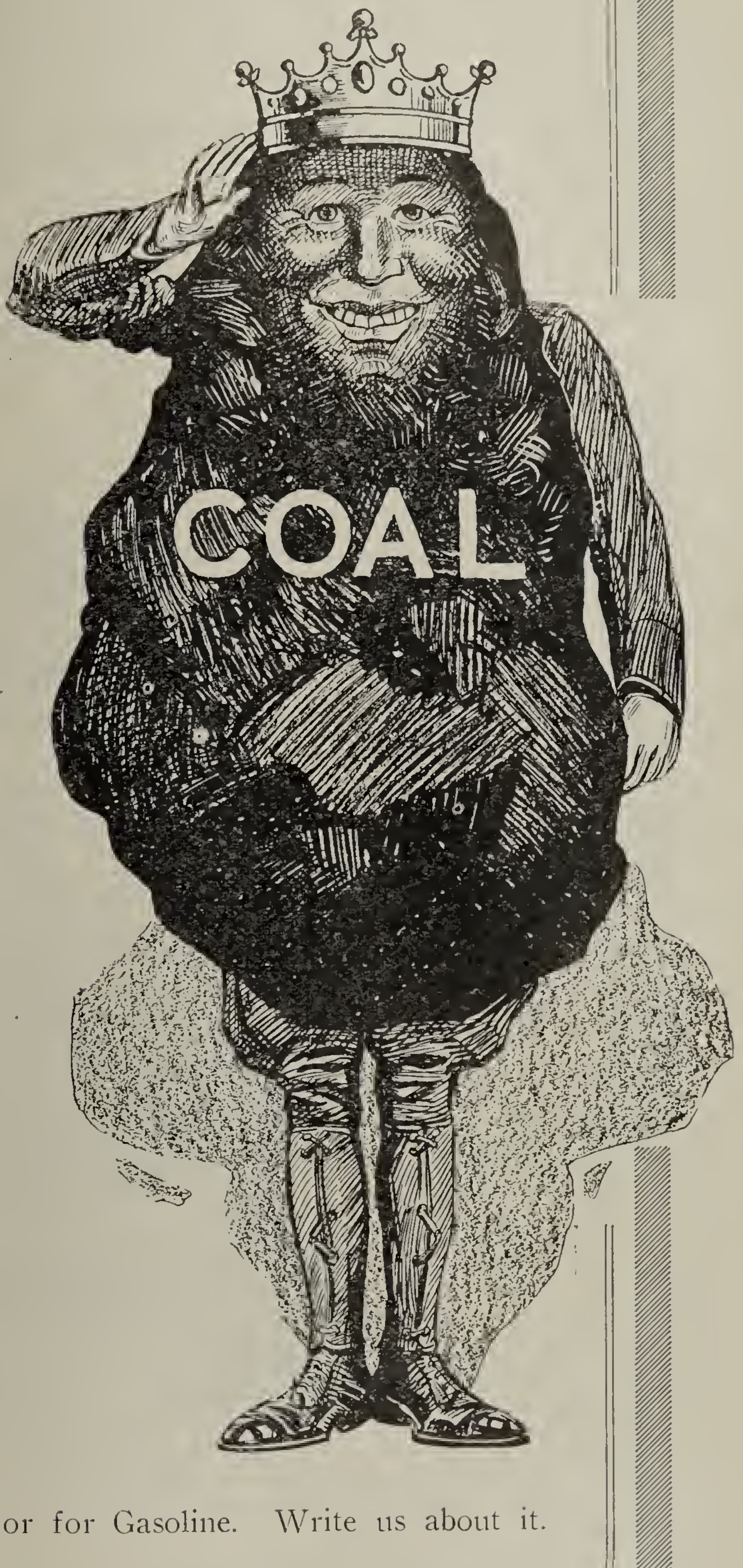
SANITARY WARE

One of the items of growing importance in the clay working industry is sanitary ware. This clay product has been classed in the pottery division right along and has now attained a total of about $8,000,000 a year. For the calendar year 1916 sanitary ware was reported from eleven states, two new states entering, Michigan and West Virginia. New Jersey is the big center of production in sanitary ware, reporting approximately 60 per cent. of the total output of the country. West Virginia occupies second place and Indiana third. With these three states there has been large increases in output of late and presumably there is an increased production in other states. The increase was very marked in 1916 and logically should be continued in 1917 but for the interference of war conditions.

One result of war conditions has been to stimulate the export trade a little in sanitary ware and already this is attaining distinctive proportions. During the past year there was exported sanitary war to a total of $214,076, and the splendid feature about it is that most all of this went to the Latin American countries. An example of how the trade has progressed in these countries is furnished by the comparative figures of 1915 and 1916. For example, Central America and the West Indies bought during 1915 sanitary ware totaling $27,867, and then made this look small in 1916 with a total of $105,630. Meantimes our imports of this ware have dwindled down along with other pottery imports so that they are a rather insignificant item.

To sum it up briefly, sanitary ware of the pottery industry has a future before it, not only in the domestic trade, but there are also big prospects of a wide field of the pottery business in the Latin American countries south of us.

King Coal Salutes the Brickmaker



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King Coal Salutes the Brickmaker:

King Coal wants to know what the brickmaker and other clayworkers have to say about it. He says:

"What's It To You?"

King Coal is king and he is boss of the Clay Industry. If King Coal isn't boss, how do you account for the heavy falling off in the brick business?

You can't pay tribute to King Coal and make your products at a cost to compete.

Why not tell King Coal "Where to Head in," by using only half as much coal?

That's a good thing to do no matter what the coal price may be, but it's almost a necessary thing to do when the price is high.

We can help you beat King Coal while he is arbitrary and unreasonable in price and you'll have the saving habit so that for all time you'll make a saving of half your fuel.

The Haigh Continuous Kiln will fight King Coal for you. It will save half your fuel and half your kiln labor. Put the saving in the bank for Christmas or for Gasoline. Write us about it.

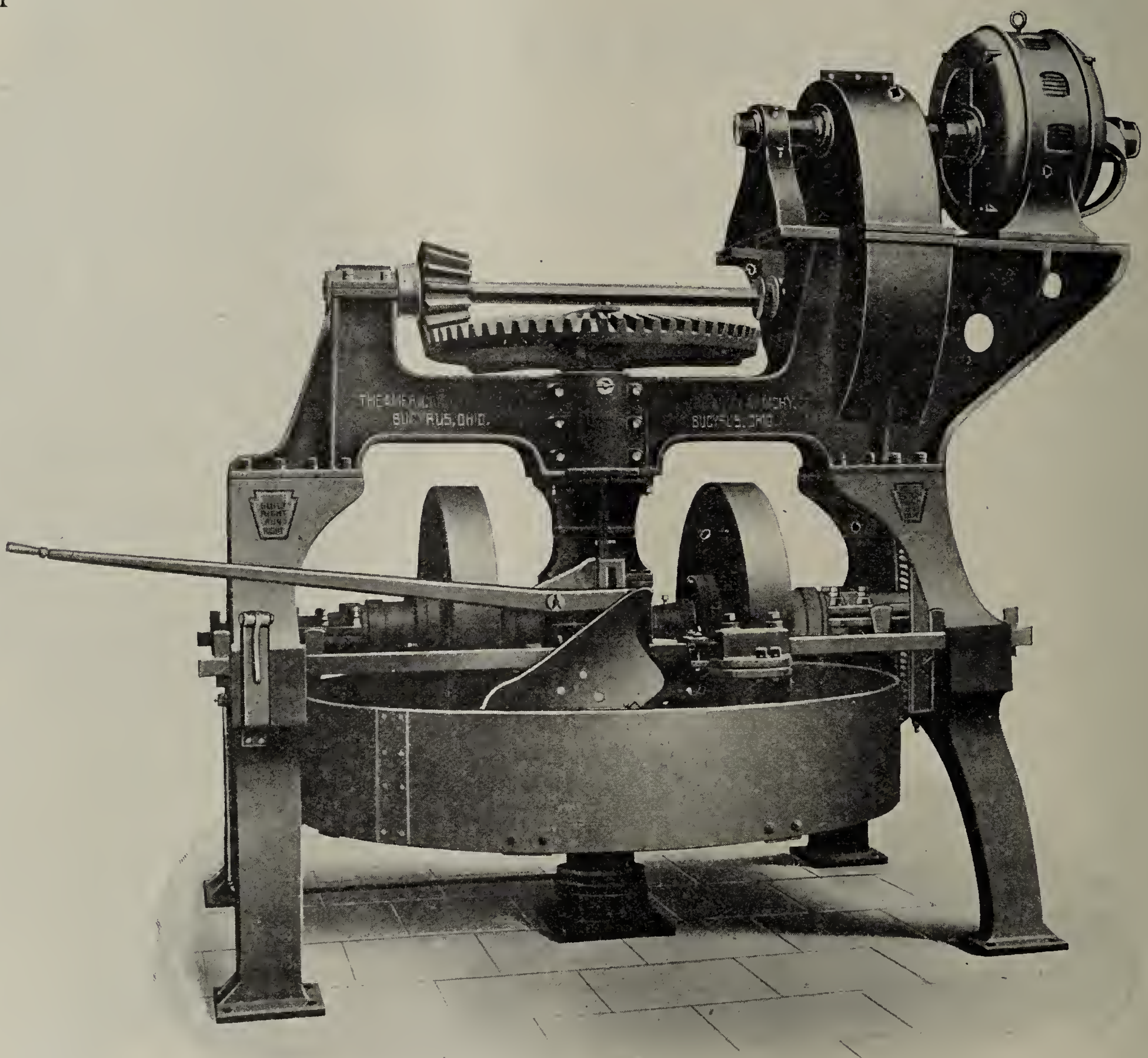
The American Clay Machinery Co.

Bucyrus, Ohio

A Modern Pan

Here is a Motor Driven Wet Pan with Mechanical Unloader. Our pans are always well built and will perform splendid service. Let us send you our Pan Specification Sheet.

We build everything needed by the clayworker and solicit inquiries.



The American Clay Machinery Co.

Bucyrus, Ohio

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

A SPIRIT OF UNCERTAINTY prevails throughout the clay products industry. A general shortage of labor is left by all and the transportation problem has been further complicated by the recent order of the Government withdrawing all gondola cars from general use. This makes it difficult for the brickmakers to transport any materials which are not at hand near their yards. Also it works a hardship in the shipping of the finished product, which must now go in box cars. On account of the general shortage of all freight cars, the order order has gone forth that these cars must be loaded to the limits. Breakage has been greatly increased by this order, and the expense of loading and unloading has been materially increased from the necessity of using box cars. The Southern Pacific has not yet put into effect the order that no clay, rock, sand and gravel be hauled in gondolas and some is still moving. This is expected to end, however, any day, and when it comes the clay workers will be greatly handicapped. The general shortage of labor is felt very keenly in the trade. It is stated that labor now costs 33 per cent. of the gross cost in making brick and tile, whereas a year ago it was scarcely 20 per cent. The tendency is still higher, as the men are lured away to other lines of work by attractive offers and the opinion was recently expressed that brickmakers would be getting $5 a day by next year unless something happened to hol dthem to the brick yards.

Notwithstanding the above condition in general, there is a good demand for both brick and tile products. The Government is figuring on a number of warehouses that will consume a large number of brick, and the city of San Francisco will build over a score of new school houses next year. Bonds have been authorized for these schools and plans are already under way in a number of architects' offices. This means there will be a large demand for both common and pressed brick by this municipality next year. Added to this the building situation in the principal cities of the coast shows strength. In San Francsco, it is true, the building permits fell off from $1,137,685 to $900,509 and in Seattle from $696,179 to $509,409 for the month of October as compared with September, still Los Angeles, Oakland, Sacramento and Portland all showed increases. In Los Angeles, the October permits were $988,142 as compared with $613,865 for September. Oakland showed an increase from $195,969 to $426,969 and Portland increased from $258,355 to $266,420. Sacramento's increase ran its permits from $103,174 for September to $347,469 for October, the biggest month with one exception for 1917 in that city.

Camp Fremont at Menlo Park now has all its tile pipe in place with the exception of the big outlet pipe for sewerage. When the Government reversed its decision to abandon Camp Fremont as a training ground, the city of San Francisco guaranteed that it would provide the necessary funds to build this drainage sewer, which the State Board of Health demanded for the general health of the State. This means that the city will have to raise $150,000 in the immediate future to make good on its pledge. The Mayor, City Council and many prominent citizens stand back of the pledge and there is no doubt that the money will be quickly raised. As soon as it is turned over to the Government it is expected that an order for this pipe will be given to the various companies which have been supplying the laterals already in.

The demand for fire brick continues good, mostly on Government orders or on the orders from shipbuilding concerns or others which are working on Government contracts.

The magnesite production for the month of October at Porterville, Cal., was 100 cars of calcined ore. This means that about 8,000 tons of crude material were shipped to eastern plants. At $20 a ton this represents a value of $160,000. The demand for this class of ore among brick men is brisk, with no indication of a falling off perceptible.

The California China Products Company of National City, San Diego county, California, which was forced to close down last month because of the high price of fuel oil, is now using the kilns of the West Coast Tile Company in Los Angeles for the manufacture of tile. The China Products Company will continue to use these kilns until it can complete its own factory and kilns at Los Angeles.

One of the effects of the order that all cars shall be loaded to the limit is that many users of brick products cannot be supplied, even though the same amount of brick be shipped. For example, under the old system it was customary when a customer demanded a carload or more of brick and the quantity on hand did not warrant sparing him that amount, a half or two-thirds of a car could be sent and the same amount sent to another customer. Now that every car must be loaded to capacity this accommodation method cannot be used and the same number of customers cannot be served.

N. Clark & Sons have been selling considerable sewer pipe to the Government for use at Camp Fremont, but their reserve stock is now almost exhausted. This company has not yet replaced its plant at Alameda, which was destroyed by fire several months ago, because it could not arrive at a satisfactory agreement with the insurance companies over the amount of loss. These matters have been practically all adjusted now and the company has begun to clear away the wreckage preparatory to rebuilding.

At the recent Land Show held in this city, several of the brickmakers took advantage of the opportunity to advertise their wares. Among them was the Port Costa Brick Works, which made a display by means of a collection of photographs showing how it manufactures bricks at its plant. The pictures attracted considerable attention and it is said that they may be displayed in some of the California schools in connection with visual instruction courses which are now so popular in this State.

The entire plant of the Washington Brick, Lime and Sewer Pipe Company of Dishman, Wash., was totally destroyed by fire of unknown origin last Saturday morning. The loss is placed at $100,000, wholly covered by insurance. It is announced that the factory will be rebuilt as soon as possible. There was some talk that the fire was incendiary, but no evidence to that effect has developed, and as the company was not working on war ordesr it seems unlikely.

The Union Iron Works recently purchased 1,250,000 bricks from the Port Costa Brick Company, for use in its shipbuilding plant in Alameda. SUNSET.

San Francisco, Nov. 6, 1917.

Who Won.

Dutch Daly, an entertainer once well known in this country, but now a favorite in England, tells this story:

A certain man, feeling exceedingly unwell, inquired of a friend whom he should consult, and was recommended to an eminent specialist.

"Is he very expensive?" asked the patient.

"H'm, no; he'll charge you $5 for the first visit and $2.50 afterward."

So the invalid went off to the doctor in question, and upon being admitted to the consulting room, slammed down $2.50, accompanied by the remark:

"Well, doctor, here we are again."

The doctor calmly picked up the money, opened his desk, placed it therein and locked the drawer.

The patient waited events.

"Well, aren't you going to examine me?" he said, at length.

"No," said the specialist, "there's no need to do it again. Just keep on with the same medicine. Good day."—Christian Herald.

The Annual Meeting of the American Face Brick Association and
The Face Brick Dealers' Association Will be Held
December 12, 13, 14, 1917 at the

FRENCH LICK SPRINGS HOTEL

FRENCH LICK, INDIANA

THE HOME OF PLUTO

FRENCH LICK SPRINGS

"THE CARLSBAD OF AMERICA"

is an all-the-year-round resort. Famous the world over for its glorious air and sunshine and the medicinal properties of its spring waters. The weather is mild and delightful in the fall and winter, and the temperature of the waters is always the same.

This beautiful resort offers you the advantages of the most famous spas of Europe. No resort in the world has the equal of this hotel's equipment. Its bath houses are a marvel in their completeness. There are accommodations for 600 guests, with all the comforts of home, and all sleeping apartments outside rooms.

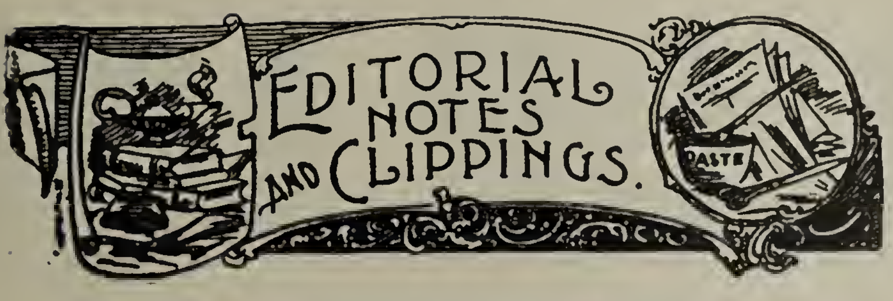
AMUSEMENTS.

GOLF, TENNIS, HORSEBACK RIDING, AUTOMOBILING, FISHING, MUSIC, DANCING, DELIGHTFUL SOCIAL ATMOSPHERE; IN FACT, EVERYTHING TO MAKE THIS AN IDEAL SPOT FOR SEEKERS OF HEALTH, RECREATION, OR REST.

LOGAN & BRYAN, BROKERS. OFFICE IN HOTEL.
PRIVATE WIRES.

Write for Booklet of Full Particulars and Reservations to

FRENCH LICK SPRINGS HOTEL - FRENCH LICK, IND.



EDITORIAL NOTES AND CLIPPINGS.

The Standard Brick Company, of Crawfordsville, Ind., has filed preliminary certificate of dissolution.

The Lawrence Brick and Tile Company, of Lawrence, Kans., has been forced to close down temporarily, owing to the coal shortage.

The Huntington Clay Products Company will build an additional dryer at their plant at Huntington, W. Va., which will enable them to largely increase their product.

The Acme Construction Company contemplates the erection of a brick plant at Wililamson, W. Va., of 15,000 daily capacity, and would like prices and catalogues of soft mud brick machinery.

Frank X. Brooks, one of the pioneer brick manufacturers of Lewiston, Me., died at his home in that city October 26, at the advanced age of seventy-five years. He is survived by his wife and two sons.

The Elgin Brick and Tile Company, of San Antonio, Texas, has been capitalized with $100,000 capital stock. The incorporators are S. F. Kirksey and K. D. Dunn, of San Antonio, and L. T. Adams, of Jack county.

The Duro Brick Manufacturing Company, of Akron, Ohio, has been incorporated by O. A. Alspaugh, Newton J. Long, Fred W. Jones, Carl H. Whitman and T. W. Kimber. The company is incorporated with $200,000 capital stock.

James A. Staub, of Hanover, Pa., one of the pioneer brick manufacturers of that section, died at his home in that city October 31, quite suddenly. His father had originally operated the plant at Berlin Junction, and the son continued the business after his death.

The plant of the Athens Brick Company, Athens, Ohio, in the very center of a coal mining district, with a dozen big mines in operation within a radius of ten miles, closed down recently for lack of fuel. The trouble was caused by a strike of the coal miners in that section, and as soon as the miners go back to work, the plant will no doubt start up again.

The Kalona Clay Company, one of the rapidly developing concerns of southeastern Iowa, is making a bond issue of $200,000 to take care of the expansion of its brick and tile business, which has become very large. Among the stockholders are F. X. Freyder, G. W. Schmidt, S. T. Morrison, Hugh W. Smith, W. T. Goodwin and J. O. Schulze, all of Kalona.

The Bickerstaff Brick Company, with general offices in Columbus, Ga., and plant at Brick Yard, Ala, is among the best-known clayworking institutions in that entire section. This company has been manufacturing high-grade brick for thirty years, and its product can be found in numerous buildings in Georgia, Alabama and Florida. A. H. Bickerstaff is president; Hugh Bickerstaff, secretary, and F. J. Bickerstaff, vice-president and general manager of the company.

A big new department for the manufacture of fire brick has been completed at the plant of the Roper-Strauss-Ferst Company, Inc., at North Birmingham, Ala., formerly the North Birmingham Fire Brick and Roofing Company. The plant has been producing hollow tile altogether, the greater portion of the output going to Atlanta, The new department will produce upwards of 25,000 fire brick a day, and a big demand is expected for the stock. The plant covers four and a half acres of ground, and the tile and brick are produced from shale. The development just finished cost not less than $25,000.

Isaac W. Budd, founder of the City Line Brick and Lumber Company, Camden, N. J., died at his home in that city. Mr. Budd left an estate estimated at $800,000.

The Gordon Brick Company, of Phoenix, Ariz., reports quite a busy season. They recently furnished the brick for a large apartment house, using their special red brick, which were laid up in white mortar.

The Tongue and Groove Brick Company, of Wilmington, Del., has been incorporated with $200,000 capital stock. The incorporators are John B. Porter, Jeremiah J. Lynch, John Kennedy Wallace, Buffalo, N. Y.

The Pennsylvania Clay Products Company, West Winfield, Pa., recently mailed a card announcing the death of Frank B. Hartford, which occurred October 10, at his home in Toronto, Ohio, after an illness of six weeks.

Harry Walters, formerly manager of the Brazil Hydraulic Press Brick Company and later in charge of the sales department of that company, has been appointed head of the sales department of the Clay Products Company, Indianapolis.

Plans are now under way by the Woodburn Brick and Tile Company, Woodburn, Ind., for the erection of a new plant on the site of the one recently destroyed by fire. It is expected to have the plant completed during the winter so as to be ready for operation in the early spring.

R. W. Besley, general manager of the Table Rock Brick and Material Company, Table Rock, Neb., was a visitor at The Clay-Worker sanctum recently. Mr. Besley has been making an extended trip through the middle states, purchasing additional equipment for the brick plant, with a view of increasing the output to 100,000 brick per day. The company recently booked an order for 2,000,000 silo block.

The Cannon-Phillips Company, of North Sacramento, Cal., successors to the Dennison Block Company, is installing a number of improvements at its plant near Ben Ali. A large storage shed is being erected, and a switch is being laid so that several cars may be unloaded at the same time. The shed will have a capacity of several tons. Labor-saving apparatus for unloading the cars is also being installed.

A new memorial gateway, to be placed at the entrance to the grounds of Alumnae Hall, Elmira College, has been presented to the college by Harry S. Doty, of Passaic, N. J., and his brothers for their mother, Mrs. Elizabeth C. McCorkindale Doty, of the class of 1877. The gateway is to be built of rough texture brick and white stone trimmings, in keeping with the character of the dormitory, and will be fitted with a wrought iron gate and grill work.

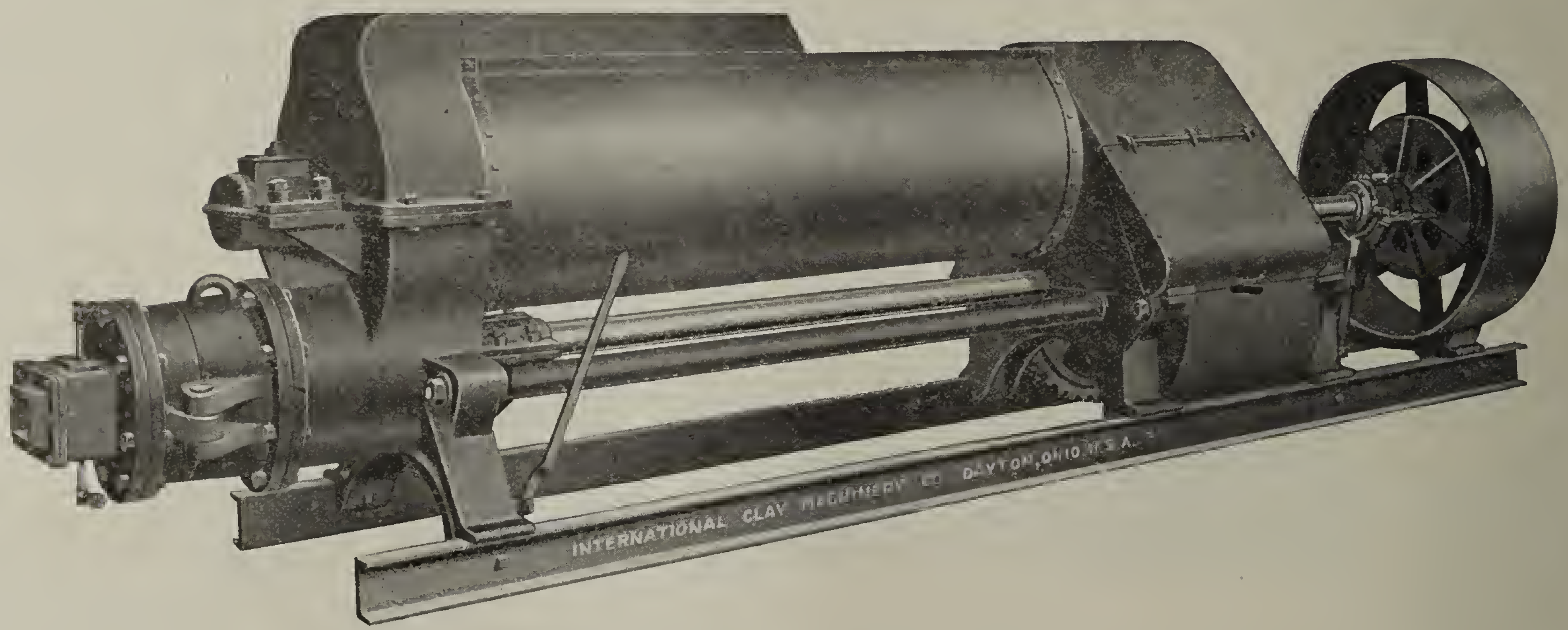
The long anticipated action of the government in building immense terminal docks at Perth Amboy, N. J., is at last taking form, and plans are now under way for the erection of about sixty buildings, which it is to be hoped will be of brick, to be constructed on either side of what is now known as the Bloomfield dock. Over 2,000 acres of land has been purchased in this connection by the government, and takes over clay lands owned by C. A. Bloomfield and the Raritan Ridge Clay Company.

The Excelsior Fire Clay Company, of Lisbon, Ohio, has been reincorporated with $30,000 capital stock. F. R. Shunk and J. R. Sprankle, of Cleveland, who are interested in the Saratoga Fire Clay Company, of Lisbon, are president and vice-president of the company; Fred G. Davis, of Lisbon, is treasurer, and Walter L. Ogden, of Lisbon, former sole owner of the plant, will act as secretary and general manager. The company has been engaged in the manufacture of chimney tops and flue linings and other fire clay products, and it has

(Continued on page 472.)

BRICK, TILE AND

ON ONE MACHINE



**Type 470 Combined
Auger Machine**

CAPACITY IN BRICK

20,000 to 40,000 per day of 10 hours

Let Us Tell You

INTERNATIONAL CLAY

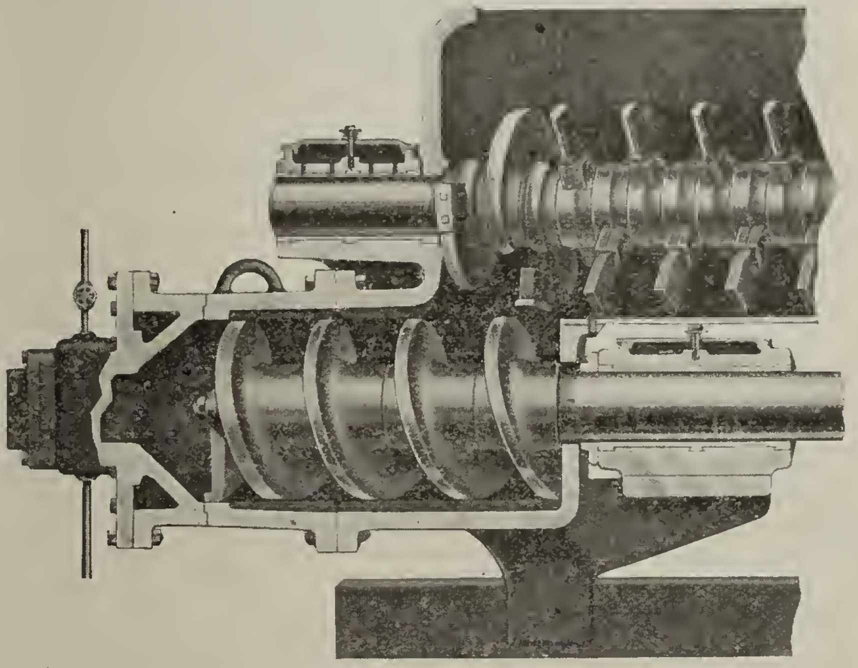
DAYTON,

HOLLOW-WARE

Type 470 is single-geared.

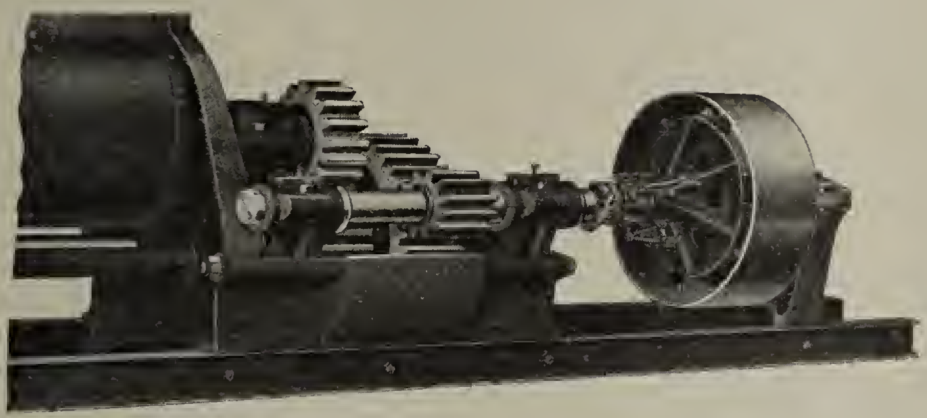
The auger mechanism is practically straight for its entire length, fitting the machine for the manufacture of tile and all kinds of hollow-ware, as well as brick.

The augers, high pitched and fast, are made from a special mixture compounded from our own formula, the entire mechanism being very hard and tough.



AUGER MECHANISM SHOWING POSITIVE FORCE FEED

The pug mill knives are separate from the hub and are easily replaceable.



DETAIL OF REAR FRAME AND GEARING

The pugging chamber thrust is of the marine type, while the auger thrust is submerged.

The pug mill or pugging chamber at the discharge end is fitted with large wipers, giving a positive force feed to the auger mechanism.

More About It

MACHINERY COMPANY

HIO, U.S.A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

been stated that the company will enlarge the plant and engage in the manufacture of other products.

W. H. Bond, of Beatty, Nev., and W. L. Marks, Manhattan, that state, will develop a kaolin deposit which they own near Beatty.

The Tiernan Brick Company's plant at Macomb, Ill., was destroyed by fire November 8, caused by the ignition of some asphalt paint.

Application has been made for a charter for the Big Level Clay and Land Company, by Ellis L. Orvis, L. L. Harvey and J. Ellis Harvey, of Mt. Jewett, Pa.

The plant of the Mountain District Brick and Tile Company, Nanaimo, B. C., was recently totally destroyed by fire, with a loss of $25,000. It is expected that the plant will be rebuilt and new machinery purchased.

The National Mosaic Tile Company is a new organization which is successor to the National Mosaic Flooring Company at Mobile, Ala. The new concern is headed by W. D. Bellingrath, who is also president of the Mobile Chamber of Commerce.

E. W. Farr, of the Barkwill-Farr Brick Company, of Cleveland, Ohio, is one of a number of Cleveland men who have been selected by the government to go to France to help direct the work the United States expects to do along construction lines.

The plant of the National Paving Brick Company, of South Zanesville, Ohio, formerly the old Bolen Brick Company, was badly damaged by fire, recently, which originated in the kiln sheds. The loss is estimated at $4,000. The burned portion will be rebuilt at once.

Announcement has been made by the officials of the Casper (Wyo.) Brick and Tile Company that work on the new plant will be started in a short time. The capacity of the new plant, which they hope to have in full operation by March 1, 1918, will be 60,000 brick per day.

The Central Ohio Brick Company, of Zanesville, Ohio, was recently organized with $500,000 capital stock. The chief stockholder is James Ford, who is also chief owner of the National Brick Company of that city, and it is more than likely that the latter company will be a part of the new organization.

It is thought the Eureka Fire Brick Company, Dunbar, Pa., is the first clayworking concern in the country to introduce girls as workers on a brick plant. So many of the company's employes have answered their country's call that the company decided to fill the vacancies with young women. There is no fixed scale for them, as they are paid by piece work, the same as the men. The experiment will be watched with no little interest.

A number of extensive improvements have just been completed at the plant of the Ferro Brick Company at Watsontown, Pa., including the installation of new machinery, and the building of a new dryer and several kilns. C. L. Peasley, the secretary of the company, states that the capacity of the plant has been more than doubled, and while the chief output for some time past has been red shale building brick, they expect to turn out paving brick as well.

The Milton Brick Company is contemplating the expenditure of $100,000 in improvements to their plant near Milton, Pa. The work will be commenced in the near future. The improvements will include a plant for the manufacture of salt-glazed vitrified sewer pipe and high-grade vitrified chemical and acid ware, the addition of a large producer gas-fired continuous kiln for the burning of paving and face brick and the installation of a large screened clay storage bin. The company is also erecting several houses for the use of their employes.

H. A. Nelson, proprietor of the Nelson Brick and Tile Company, died October 31 of injuries that he sustained the week previous while working at the plant. Death was most unexpected, as Mr. Nelson, up to the day before, was showing rapid improvement and expected to be about in a short time. The injuries were caused by a fall when he broke two ribs and was hurt internally. His death was a great shock to his friends and business associates. Mr. Nelson was making a success of a plant that had heretofore met with several business setbacks. He had sold his entire output the past two years and was looking forward to another big season. A wife, son and daughter survive.

The Merwin Brick Company, of Berlin, Conn., was damaged to the extent of $1,000 by a fire which started from an overheated kiln.

Patrick R. Wrape, a retired brick manufacturer, died at his home in Schenectady, N. Y., recently. Mr. Wrape was seventy-two years old and a native of Canada.

F. R. Carter, Peoria, Ill., has purchased the plant of the East Peoria Brick Company, and will operate it in connection with his other plant, which is one of the oldest in Peoria.

The Washington Porcelain Company, of Washington, N. J., has been incorporated with $400,000 capital stock. E. Sinclair and F. F. Gardiner, of Trenton, N. J., are interested.

The drain tile plant of J. C. Davis, at Timewell, Ill., has had an unusually busy season, and is still running to full capacity. A recent shipment of one order comprised four carloads.

A charter has been issued to the Eagleville Brick and Tile Company, of Eagleville, Tenn. Those interested are J. E. Jackson, I. H. Lovelace, William Ralston, D. H. Hughes and John D. Wiseman.

The Metropolitan Paving Brick Company, Canton, Ohio, recently brought suit against the American Fidelity Company and others, for $10,798, for paving brick furnished for the paving of Stark county highways.

The A. M. Cobbe Brick and Tile Company, Jamestown, N. Y., has been awarded the contract for furnishing the front brick for the new Pennsylvania railroad station at Buffalo. Between 150,000 to 175,000 brick will be required for the work.

The first kiln of the Baker (Mont.) Brick Company was opened recently. The kiln held 200,000 brick, and the members of the firm were much pleased with the excellence of their first burn. The company has orders on its books to insure operation for some time to come.

Most of the brick plants in Connecticut have closed down for the winter season. While the manufacturers, as a rule, had a good season, with prices ruling a little higher than usual, labor was scarce, and the car shortage made life for the brick man more than ordinarily strenuous.

A number of improvements will be made in the plant of the Springfield Drain Tile Company, Springfield, Ill., during the winter months that will increase the capacity of the plant. The officials of the company are now looking into the advisability of adding silo tile to their production.

The Fulcher Brick Company, Nashville, Tenn., reports business good in all lines, orders for their products coming in, not only from the people of Nashville, but from all sections of the state. The company recently began the brick work on the new campus building for the Southwestern University at Clarksville, Tenn.

The plant of the Alsey Brick and Tile Company at Alsey, Ill., was thoroughly overhauled this summer and is now one of the most modern plants in that section. Four new 30-foot kilns and a new eight-tunnel dryer were erected, which enables the company to materially increase the output, which consists largely of fire brick. Henry T. McLaughlin is at the head of the concern, which ships its products all over the country.

The new plant of the Clay Products Company at Abingdon, Ill., which was started up the latter part of October, is thoroughly up-to-date in every particular. The plant is equipped throughout with electricity, and was designed by Hugo Layer, who has been construction engineer for the company for a number of years. At present the plant will only turn out Dennison interlocking hollow tile for the mid-western states. The main offices of the Clay Products Company is located at Indianapolis, Ind.

A load of brick is not what the average highwayman would consider an easy thing to steal, but a teamster employed by a New Orleans contractor stole a thousand brick from James Demourelle & Sons, brick dealers of New Orleans. He backed his wagon up to the brick pile shortly after 6:00 o'clock one morning and loaded up the brick, which he carted to an empty lot, intending to sell them a little later. One of the employes of the company, surmising something out of the ordinary, followed the man, and causing his arrest.

Illustration shows how Barrett's Paving Pitch clings to the blocks after many years of use.

Barrett's PAVING PITCH

Every Joint an Expansion-Joint

BLOCK paving of every kind requires something to fill the joints. This filler must accomplish a number of purposes. It must be:

Waterproof—so that the foundation is fully protected against water and frost action.

Plastic—so that all joints will be perfectly filled.

Elastic—so that after expansion and contraction of the pavement the filler still fills the joints.

Permanent—so that the filler lasts as long as the pavement.

Removable—so that openings may be made in the pavement without injury to the individual blocks.

Replaceable—so that the original blocks may be replaced and the filler renewed to match the old pavement.

Sanitary—so that the pavement affords no permanent lodging for filth and may be easily cleaned.

Quick Setting—so that the pavement may be used immediately both in the beginning and after repairs.

Barrett's Paving Pitch meets all these requirements. Special pitches are made to meet special conditions. A letter to our nearest office will bring the fullest information on all the latest developments.

The Barrett Company

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New York Chicago Philadelphia Boston St. Louis Cleveland Cincinnati Pittsburgh
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NOTES ON THE CRUCIBLE SITUATION.

(Continued from page 423.)

not so desirable. The Klingenberg clay known as A. T., requires a water content of 39.68 per cent., that designated as E. T., 50.66 per cent. The latter shows a decided tendency toward stickiness.

The quality of clay known as its plasticity or the property of permitting its molding and shaping we have as yet not been able to express numerically by means of test results All we can do at the present time is to estimate this quality by feel or by some indirect determinations. Thus we have already seen that the amount of water required to render clay plastic is a measure of its plasticity. Similarly, the shrinkage in drying is a criterion of this quality. Other means of estimating plasticity indirectly are the capacity of clays to absorb certain dyes like malachite green, the time required for the dried clay to slake down in water, the tensile and transverse strength of dried bars of clay and the fineness of the clay, with reference to the amount of material which fails to settle in water after standing for some time.

The drying shrinkage is determined either by linear or by volume measurements. Since clay never shrinks uniformly in all directions, the shrinkage determination by volume is much more accurate and reliable. For this purpose the plastic clay is made up into a briquette which is at once immersed in petroleum and the volume of which is later determined by means of a simple apparatus known as a voluminometer. The specimen is allowed to dry and is again immersed in petroleum. After standing for some time so that it is saturated with the liquid, its volume is once more determined. Evidently, the volume in the wet state, minus the volume in the dry state, divided by the dry volume, the result being multiplied by 100, gives the percentage volume shrinkage in terms of the dry volume. This value is for the A. T. Klingenberg clay, 42.58 per cent., and for the E. T. brand, 55.05 per cent.

Since in the shrinkage of clays a volume of water equal to the volume of the contraction is evaporated, we may speak of such water as shrinkage wtaer. The volume of water remaining in the clay, after shrinkage has ceased, is called pore water. Now, the relation between the volume of the pore and that of the shrinkage water is interesting and significant.

The volume relations involved may be readily computed from the following relations:

$$\frac{100\ S\ (w_1 w_2)}{w_2} = \text{Volume of total water in terms of the true clay volume, expressed in per cent.}$$

and

$$\frac{100\ S\ (v_1 v_2)}{w_2} = \text{Volume of shrinkage water in terms of the true clay volume, expressed in per cent.}$$

In these formulae:

S= Specific gravity of clay, approaching the value 2.60 quite closely for all clays of this type.

w_1=Weight of briquette in the wet state.

w_2=Weight of dried briquette.

v_1=Volume of briquette in wet state.

v_2=Volume of dried briquette.

Subtracting the volume of the shrinkage water from that of the total water, we can compute the volume of pore water. The ratio of the pore water volume to the shrinkage water volume is characteristic for the several types of clay. The lower this value the more plastic is the material in question. The shrinkage volume for Klingenberg A. T. clay is 65.4 and the pore water volume 37.6. The ratio, therefore, is $37.6 \div 65.4 = 0.57$. For the E. T. brand the value of the ratio is 0.56. For bonding clays in general, the ratio should not exceed 1.1.

A simple method for estimating the plastic character of clays consists in grinding them together with potters' flint in the proportion of 1: 1, making them up to a plastic mass, and forming one inch cubes. After drying these thoroughly and immersing them in water, the time required to slake the clay down to a mud is characteristic of the structure of the clay. Heavy, "fat" clays will break down very much slower than lean, and less plastic ones. The slaking time for the Klingenberg clays A. T. and E. T. is 78 to 108 minutes, respectively.

The mechanical strength of dried specimens of clay prepared from the unmixed material, or from a 1: 1 mixture of clay and sand is another means of estimating indirectly the plasticity and bonding power. This is especially true when the sand mixture is used, owing to the fact that some of the very "fat" clays are apt to check and crack in the drying, without the addition of a non-plastic. The tensile strength is determined upon specimens made in the form of cement test briquettes, which are broken in a suitable machine. The transverse strength test which is now made more commonly, employs bars 7x1x1 inch, which, when dried, are loaded at the middle and broken. From the dimensions of the bar, the span and the load and the modulus of rupture is determined, expressed in pounds per square inch. For the Klingenberg A. T. clay, mixed with sand in the proportion of 1: 1, the modulus is 381, and for the E. T. material 363. The higher the strength is, the greater should be the plasticity and the bonding power.

The fineness of the clay with reference to its finest particles; i.e., grains of the magnitude of 0.01 to 0.003 mm., is indicative in general of the content of the dispersed or collodial portion, but is not necessarily a function of plasticity. Thus, by careful elutriating Klingenberg clay, using a current of water with a velocity of 0.18 mm. per second, 54.6 per cent. by weight of the material was removed. Another clay, however, decidedly less plastic, was found to be considerably finer, since 90.8 per cent. could be removed by the same treatment. Plasticity, therefore, is not merely a matter of fineness as measured by the ordinary means.

The apparent specific gravity of the dried clay is sometimes useful in comparing different materials. For the Klingenberg clays, it has been found to vary from 1.79 to 1.70.

The Firing Behavior of Clays.

With reference to the behavior of a bond clay when heated to higher temperatures, several points must be noted. These are—the temperature at which the clay first becomes dense or vitrified, the temperature at which it overfires, and the point at which it shows evidence of fusion. The first point is of importance for graphite crucibles, since it is necessary that the clay become dense at a fairly low temperature in order that it may protect the graphite as much as possible from oxidation.

The overfiring point represents that condition at which the clay shows excessive vitrification and softening under pressure. Most clays at this point begin to evolve gases which cause the structure to become vesicular or spongy. This state marks the end of the usefulness of the clay by itself. It is true, of course, that the graphite increases the refractoriness of the clay to a considerable extent, but, nevertheless, a clay in which this phenomenon is postponed to a high temperature is superior to a material overfiring at a lower point.

The firing behavior of a clay is determined by making up a series of briquettes, about 2x1¼x1 inch, placing them in a suitable kiln or furnace and drawing one or more specimens at different temperature intervals. It is necessary, of course, to maintain accurate temperature control by means of a pyrometer or by the use of standard pyrometric cones. In our laboratory it is customary to draw the first specimen at 1050 degrees C. and from there on, every additional 25 degrees C. up to 1500 degrees C.

Upon removal from the furnace the briquettes are either

(Continued on page 476.)

THE CLAY-WORKER

THE OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

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CASTING OF HEAVY CLAY PRODUCTS.

The Mechanical Manipulations Used in Casting An Open-Top Glass Pot with Heavy Walls.

By F. H. Riddle.

THE Bureau of Standards in its manufacture of optical glass has found that proper pots are of considerable importance in the ultimate successful production.

The chief objection to the standard pots is their iron content. Although this constituent is not high compared with other refractories, and entirely satisfactory for the ordinary types of glass, it is too high for use in the manufacture of optical glass.

This lack of purity has prompted the Bureau to produce porcelain pots in which high grade white burning kaolins and grogs, together with the necessary amounts of pure ball clays, feldspar and flint, are used.

The somewhat lower plasticity of these bodies, as well as the necessity for obtaining pots as quickly as possible made it advisable to try casting as well as several other methods of shaping. The porcelain bodies are also being made into pots by the usual hand-built method showing that this method is entirely feasible regardless of the lower plasticity. However, the hand building is much slower than casting.

Casting heavy clay products is not new though unusual in most countries with the possible exception of Germany. After the outbreak of the war, the method was used more extensively, and has proved very successful when the body thicknesses is not too great. Where the walls are over an inch thick the method has not been used to any extent. One firm in the United States is successfuly casting refractory slabs similar in shape to terra-cotta ashler pieces with one-inch walls and made of a mixture containing 50 per cent of 8-mesh grog. Fairly heavy pieces of electrical porcelain are also being cast.

F. H. Riddle, Pittsburgh, Pa.

The object of this paper is not so much to go into details of the principles of the casting processes as it is to describe the actual mechanical manipulations used in casting an open top glass pot with heavy walls. The thickest part of the pots in question is at the bottom, which is 3⅛ inches. The sides taper from 3 inches at the bottom up to 2 inches at the top.

The casting process, use of salts possibilities of the use of vacuum or pressure, etc., are described by Bleininger[2], McDougal[3] and Shaw[4].

Preparation of the Body.

The low water content which should be used in casting slips and which is made possible by the use of alkaline salts makes the preparation of the slip a rather laborious task, as it is commonly practiced. A simpler method is being used successfully at the Bureau. Ball mills and an ordinary double blunger are used in the preparation. This method does not apply to the preparation of refined bodies for high fire chemical porcelain, etc.

The formula of one mixture is as follows:

12-mesh kaolin grog...	20% by weight
Kaolins	27
Ball Clays	19
Flint	23
Feldspar	11
	100

All of the raw clays are mixed with the total water and salts in a ball mill and ground together until a thin homogeneous slip is formed. This slip is then run over a strong electro magnet, the iron removed, and then pumped into a blunger where the flint and spar are added. Then the grog is introduced. The latter is put in last as it mixes easily and the slip becomes very thick. If the grog and flint and spar are high in iron, they should be previously run over a dry mag-

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[1] By permission of the Director of the Bureau of Standards.

[2] Paper read before the New Jersey Clay Workers Association, 1914. Bureau of Standards Technologic Paper No. 51.

[3] Technologic Paper No. 126, Department of the Interior, 1916.

[4] Transactions American Ceramic Society Vol. XV.

netic separating machine. Both the dry and wet magnetic separators are now being manufactured as regular commercial machines.

The slip in question, when in proper condition for casting contains:

22.6%	of water by weight
77.4%	of dry body
100.0%	

The salts are equal parts of sodium carbonate and sodium silicate and are equal to .266 per cent of the total body.

To show the effect of this addition of salts, a second batch of body was taken and mixed with the exact amount of water the previous batch had, but the salts were omitted. This body mixture is fairly stiff, in fact, stiff enough for modeling. The low water content due to the action of the salts thus effects a considerabe saving in molds and resulting quicker drying.

The cause of this peculiar effect of the salts, as is well known, is explained by colloidal chemistry. The slip is made up in part of very fine suspended particles some of which are so minute that they show the peculiar phenomenon known as Brownian movement. These exceedingly small particles make up systems spoken of as suspension colloids, and possess electrical charges. In the case of clay and flint these charges are negative. When the sodium carbonate and sodium silicate salts are dissolved in water, the hydroxyl ions formed also carry negative charges. The similarly charged clay particles are repelled by those negative ions and the Brownian movement accelerated. This action is known as deflocculation. This increased dispersion of the particles due to their mutual repulsion reduces the viscosity of the system and hence lowers the water content for the same degree of consistency. If positively charged ions were added instead of the negative the reverse of deflocculation or coagulation results. This effect can be produced by the use of salts like alum, or acids.

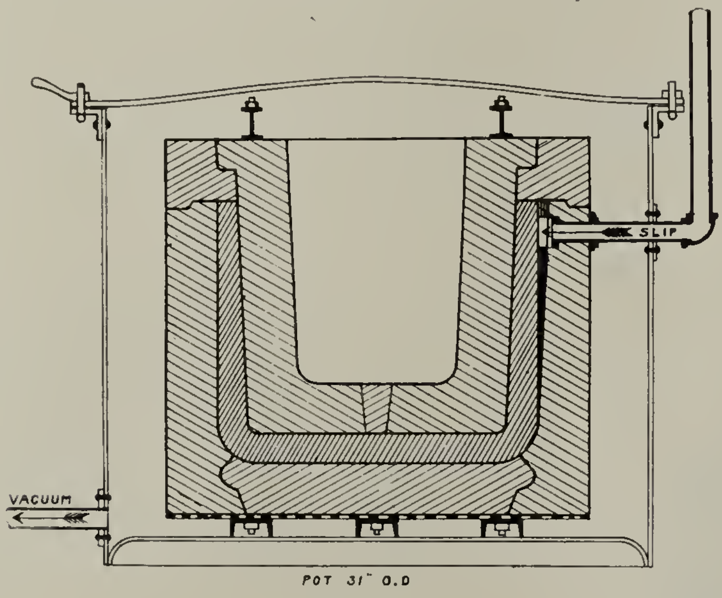


Figure 1.

The Mold.

The design of the mold, of course, depends entirely upon the shape of the ware. There are a few points that must always be considered regardless of the shape, namely:

1. To make a solid piece of ware, the slip feed pipe must enter the mold where the ware is the heaviest. The reason for this is evident. If the slip enters the mold where the wall is thin, the supply of slip will cease flowing to the heavier parts of the mold as soon as the thin part is cast solid. The thicker parts of the ware will then be hollow.

2. To make a well-finished piece of ware, the slip should not be poured in from the top and allowed to splash. It should be fed in at the bottom and allowed to rise. This not only prevents splashing but also pushes all the air out ahead. To accomplish this feeding of the slip at the bottom, a sliding pipe should be used inside of the feed pipe so that it can be drawn out after the mold is filled, or else a rubber hose which can be handled in a similar manner.

3. After the mold is full of slip it should be fed from the top as more slip is required due to absorption of water by the mold.

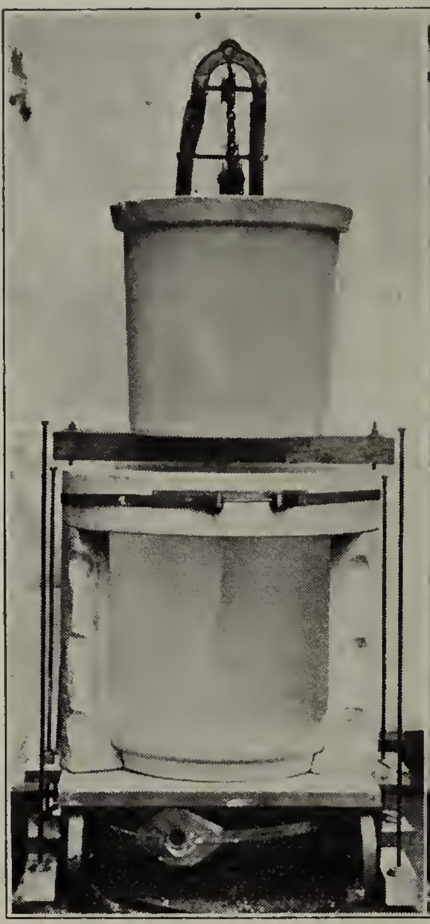


Figure 2.

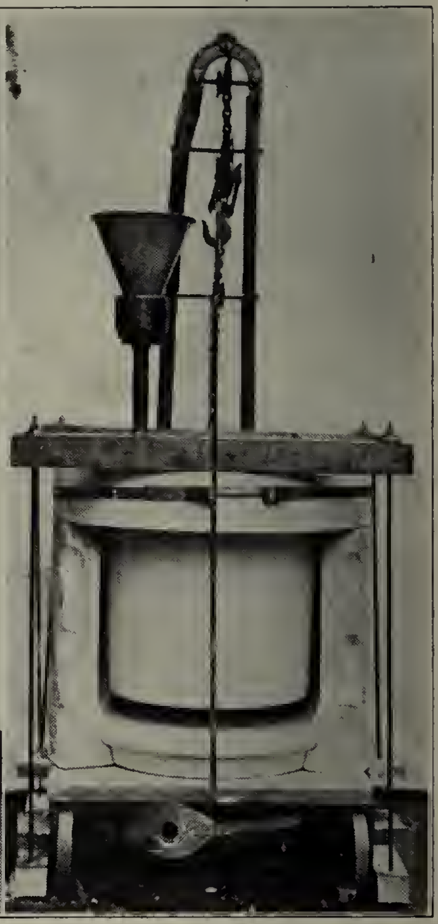


Figure 3.

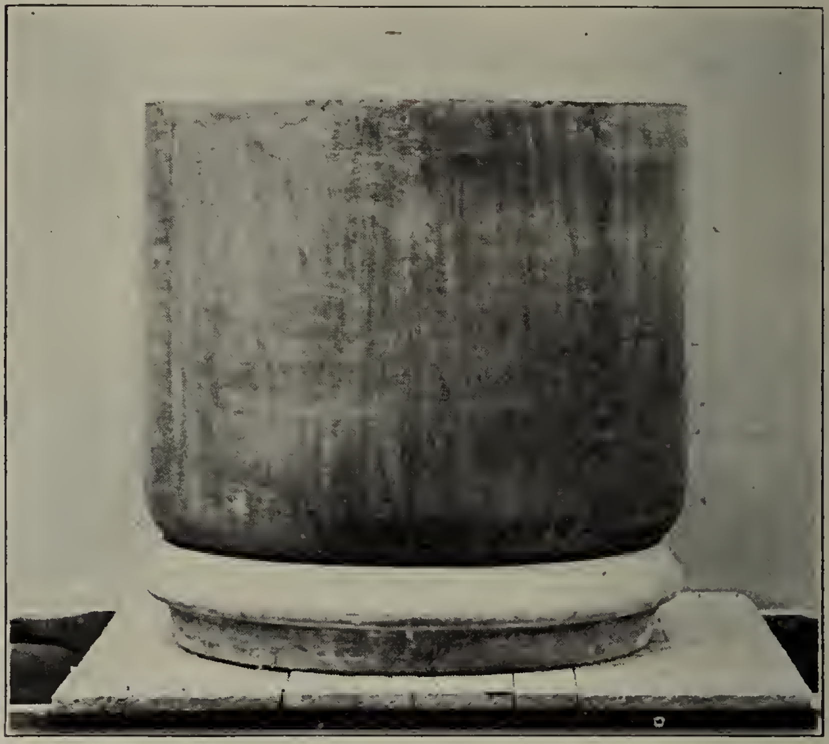


Figure 4.

This will prevent an excessive settle of grog to the bottom of the mold. In case the grog does start to settle in the supply pipe, it will have a better chance of being caught in the thicker slip in the mold that it would have if it was fed down a supply pipe that entered the mold at the bottom.

4. At no time should the supply pipe be allowed to be-

come empty and then suddenly refilled as air will be trapped and result in a blister in the body.

Figure 1 shows the cross-section of a mold and the method of supplying slip at the top. In order to have the supply channel as thick as the bottom, the side is gouged out to make the necessary cross section. This channel is shown better in Figure 5, D. 2, which is a part of one of the master mold blocks.

The section drawing also shows the bottom part of the mold or setter. This construction makes it very easy to take the mold apart and handle the ware off the platform. This is also shown in Figure 4. It is necessary to have more bottom parts but this makes it possible to keep the pots on the setter until they are dry enough to handle safely.

Figure 2 shows a mold in position and ready for casting. The front third of the shell has been removed in the photograph so as to show the position of the core. Note the manner in which the mold is bolted together and to the iron platform on which it is standing. The upward pressure due to the head of the slip is very great in its total effect and the higher the supply funnel is above the mold, the greater it must, of course, be. For casting purposes the greater the pressure the more solid a body will be obtained. With the funnel three feet above the top of the mold the pressure is so great that it is necessary to use considerable care in bolting the mold together, especially across the center to hold the core rigidly. The ties are so arranged that the core can be released while the rest of the mold is bolted down to the base of the crane so that the mold is held rigid when the core is lifted out after the piece is cast. See Figure 4.

The Casting.

The slip, in a thoroughly mixed condition, is poured into the mold through the supply pipe. This pouring should be continuous, and at no time should the flow be broken as bubbles are apt to be formed. If the supply pipe goes into the mold vertically as in Figure 2, the slip can be fed to the bottom first by inserting a pipe, of proper length and diameter, into the regular pipe and then removing it when the mold is full. While the ware is casting, the funnel should be kept full of slip, and refilled as required. The pot shown in Figure 4 was cast for 26 hours (broken section passed around) before the absorption of slip ceased. It was allowed to stand for a couple of hours after removing the feed pipes and then the core drawn out. Figure 1 shows the core in cross-sections and the air inlet hole in the center. Figure 3 shows the core removed from the mold. The rest of the mold was also removed and the pot left standing on the bottom. As near as it is possible to judge, this pot, which was about 28 hours old, was in the same conditions as a hand-built pot is three weeks after it is built. Allowing two weeks to build, it would mean a saving of at least a month.

Sufficient work has been done with the casting process to show that it is possible to make open glass pots successfully. They can be made cheaper, faster and at least as dense as pots shaped by hand, and bodies lower in plasticity can be used. The cost of the mold is not great when a master mold is made so that several molds can be cast. Figure 5 shows the various parts of the master mold used for this particular pot. Set A is the core block and case. Set B is the case for the bottom. Set C is the block and case for the top ring. A coddle has to be used with this set. Set D is the block and case for one of the three side pieces. It is also necessary to use a coddle with this set. Each side piece requires a set similar to this. In all, there are 24 separate pieces to this set of blocks and cases necessary for casting a complete mold, but it can be done quickly when the parts are arranged with a convenient bench and proper plaster buckets are available.

With a properly arranged work room supplied with a trolley conveyor and chain block and convenient slip delivery pipes two men can cast, at a conservative estimate, ten pots a day, and take care of them. This would require 20 molds. An

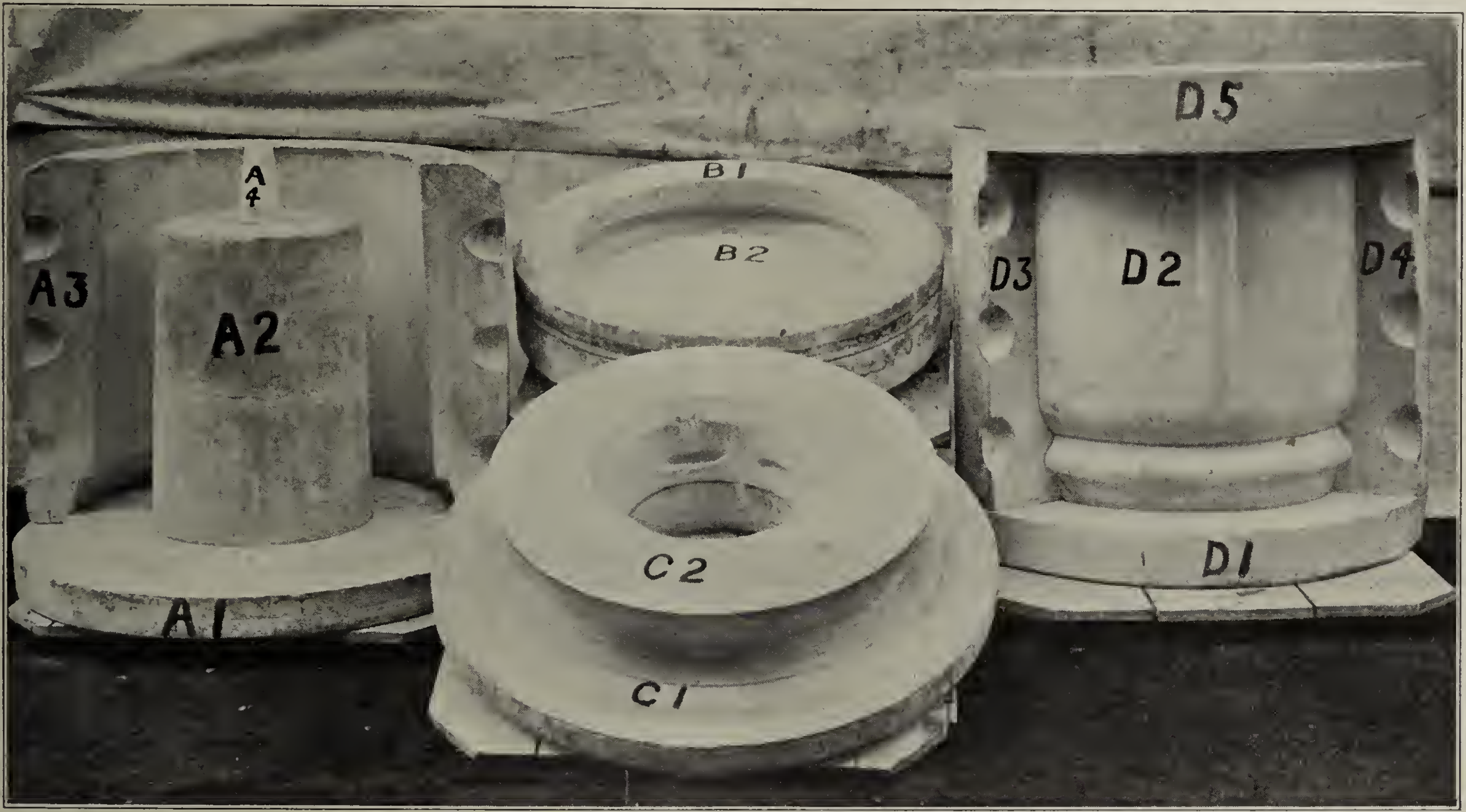


Figure 5.

ordinary prong truck, similar to those used in sewer pipe shops would make the handling of the pots very easy.

The success we have had with glass pots leads us to believe that the casting process can be used much more extensively than is now, the custom, and that its use will result in a more uniform product at a cheaper cost of production.

Figure 1 shows a tank built so the mold can be set down into it and put under a partial vacuum. It is hoped that experiments with this method will result in making it possible to cast much thicker pieces and also do away with the use of cores. If the cores can be done away with it will be possible to cast covered pots and other difficult pieces. Ware which had walls of different thicknesses would then be cast in molds that also had walls of different thicknesses. The thinner the wall of the mold, the greater the suction and consequently the thicker the casting so the mold walls would be exactly opposite in thickness to the walls of the ware. This method has been experimented on in Europe apparently with some success.

The Bureau has been lining some glass pots with a different quality of material from the body of the pot. This has been done by hand but it is proposed to do it by the casting process. Small pieces have already been handled this way.

There is no apparent reason why this method can not be used in the application of engobes to bodies in sanitary and chemical ware where the shape permits. It is a subject that is worthy of considerable experimental work and the Bureau hopes to be able to accomplish more as time permits.—*Read before the New York State Branch of the American Ceramic Society, November 19.*

BOYS' FIRE BRIGADE SERVES NEW YORK.

Boys in the congested section of New York City have organized on their own initiative a junior fire brigade. This brigade has been organized by the boys to co-operate with the city in preventing fires. Each member signs the following pledge:

"I, the undersigned, pledge myself to prevent fires, to help educate the people to prevent fires, and to do my duty at all time."

Signed................................

The boys are eager to engage in the work of fire prevention as a patriotic duty of real value at the present time when all resources must be carefully conserved. They will call the attention of their neighbors to common fire hazards, attempt with the utmost persistence to have these hazards eliminated, distribute fire prevention literature where it will be of real value, and possibly arrange for meetings on fire prevention in their schools. Fire Commissioner Adamson will furnish fire prevention literature to the boys for distribution. He hopes that the movement will spread throughout the city.

The Seven Ages of Locomotion.

As Favored by Man:

At 5 years	Roller skates
At 15 years	A bicycle
At 20 years	A birch-bark canoe
At 30 years	A French racer
At 45 years	The 8:00 o'clock local
At 60 years	The taxies
At 75 years	A wheeled chair

Often there is a direct connection between what a brick plant costs and how fast it depreciates, for a cheaply constructed plant with out-of-date equipment certainly depreciates more rapidly than one which is up-to-date in equipment and well constructed.

Written for THE CLAY-WORKER.

BUTTON-HOLE TALKS.

Gates Caught in the Act by a Camera Fiend.

LAST winter I wrote you of a sunny day I spent in the Pueblo of Santa Clara, New Mexico. While I was busily engaged there another visitor snapped a kodak and today I am in receipt of the results which sets me thinking and brings it all back to me vividly.

The camera caught me in a very unusual and extravagant mood. I had sat down on the ground, wound up my legs, arranged my feet so that they would not obstruct the view, and started my sketch when the aggregation, a part of which appears in this picture, assembled about me. When I say about me I mean literally what I say. They came close and there was no standing room left in my immediate vicinity. Those tall enough clustered closely and peered over my shoulders, while other tall ones tried to look over my feet. I was completely and closely hemmed in by a circle of eager and inquisitive aboriginal Americans and my view of the adobe buildings was completely cut off. I lost all desire to sketch the buildings in longing for the ability to sketch the group. The receipt of this print brings it all back to me in the showing of the few of them that the camera caught.

Gates in the Role of Spendthrift.

When the camera caught me I was, for the one and probably only time, a reckless, wealthy, unaccountably crazy, spendthrift. I was deliberately throwing some forty or fifty cents, in pennies and nickels, for races and scrambles. Pennies were unknown there, but they looked like real money and as they probably couldn't spend them, might be keepsakes that would lead them to habits of saving. To that extent I was a philanthropist. Really I don't pride myself that it was my own peculiar style of physical architecture that attracted them so much as a desire to see what the crazy man would do next, and a desire to have a look at him before his keeper came and took him away.

As usual in such cases the dude got to the front though from the way he had his hands in his pockets, I am inclined to think that he had already gathered his full share of the coin. He is in knickerbockers, shoes and stockings and, from the look on his face, seems to be telling himself that now that he has the coin safe in his hands, and his hands safe in his pockets, he will have his picture taken. He is too sophisticated and doesn't interest as the others do. The next three are interesting in the very human trait that they show, a trait that seems to hit all human kind, their heads have been turned by money. The short, stalwart young Indian, wearing father's pants, interests me much more. There is much firmness in his pose and one would expect to find it there. From personal recollection I know that wearing father's pants, and keeping your social standing among such a group, not only engenders firmness but absolutely requires it at the start. I wager that the wearing of those pants in the manner he is wearing them is a badge of victory of many a fierce encounter more important to him that any conflicts of the world war now waging. Indeed however ignorant and indifferent he may be as to the world war he has won the right to wear those pants and to wear them publicly and obtrusively by his own sturdy might, and the little Percy who grins at the camera dare not say him nay. There is an air about him, too, for he also has his eye on the money, that indicates to me a determination to have some of it if not indeed all of it. He has his gang with him, resolute, husky and determined and, if I can read character, whatever of the spoil those others do get they had better go bury at once or his gang will search them. So resolute does he appear that I think he would have climbed me had I not been so tall to see whether I had any left.

The thoughtful looking Arthur, in the middle of the picture and looking right at you, is evidently planning. That he has been more than active in the tussle is evidenced by the condition of his shoe which wants to come off. He will need to use all his wits for the last member of the gang, at the extreme left of the picture, and wearing father's coat and so probably the brother of the one wearing father's pants, evidently has his eye on him and is studying as to whether he has any of the coin in his pocket. Incidentally, judging from the clothes of these two boys, father must be away.

But however much I may look at the others, my eye comes back to the hero of the pants. What a sturdy form, what a firm poise and then, looking closely, note the clenched right fist, the manner of which tells the story that he has been there before, and is soon to be there again. Surely there was something doing after I left.

One can but note, too, that the stratification of society obtains here as elsewhere. The row directly in front of me, in the bright sunshine, breaks suddenly and abruptly into the shadowy and sinister line of the gang, all costumed in the garments of their absent, or sleeping, sires. It is a pity indeed that the camera caught so few of these for, although they are shadowy, and dark and sinister, they are intensely interesting.

Sometime I hope to go back and visit them again. I can but think, however, as I take another look at the hero wearing the pants, that I had better not defer the trip until he grows up. All he lacks, in the picture, is size—he already seems to possess all the other requisites. They say that "The good Indian is the dead Indian" and the picture indicates that this Indian is not all a dead one. GATES.

Figures compiled by the government show an increase of 12 per cent. in the quantity of petroleum marketed during the first seven months of 1917 as compared with the same months in 1916, and at the same time they showed an increase of nearly 19 per cent. in consumption. This is the thing that naturally leads to activity in developing new wells. So long as war conditions prevail the demand for oil is likely to show gains on the supply unless enough new development is carried forward to materially increase the present record production.

TEST TO SHOW DETERIORATION OF COAL DURING STORAGE.

A REPORT on the deterioration in the heating value of coal during storage, covering a five-year period, has just been issued by the Bureau of Mines, Department of the Interior, as Bulletin 136, Horace C. Porter and F. K. Ovitz being authors.

The tests show that the amount of deterioration of coal in heating value during storage has commonly been overestimated. Except for the subbitumious Wyoming coal, no loss was observed in outdoor weathering greater than 1.2 per cent in the first year, or 2.1 per cent in two years.

The loss in heating value is given for New River and Pittsburgh coals during five years' storage in the open air and under water, for Pocahontas during two years' storage in the air, and for Sheridan, Wyoming coal, during two and three-quarters years' storage in the air.

The tests with New River and Pittsburgh coal were made to determine the advantage to be gained by storing coal under water, and particularly under salt water. The results show that storage of New River coal under water effectively prevents deterioration of calorific value and that storage in the air under severe conditions causes only small deterioration, about one per cent in one year's exposure and about two per cent in two years. After two years the loss is continuous but slow, reaching 2.5 to 3 per cent in five years. The deterioraton of Pittsburgh coal during one year's open-air storage was practically negligible. During the second, third, fourth and fifth years the deterioration proceeded very slowly and did not reach an amount greater than 1.1 per cent in five years. The submerged portions suffered no loss measurably by the degree of accuracy of the methods used.

The tests of Pocahontas coal, a semi-bituminous type, were undertaken chiefly to determine the effect of tropical conditions in Panama. They were made on out outdoor pile of 100 tons of run-of-mine coal. During two years' outdoor exposure this coal deteriorated less than one per cent in heating value.

The Sheridan, Wyoming, subbituminous coal, known also as "black lignite," is commonly supposed to deteriorate rapidly in storage, especially by "slacking" or crumbling of the lumps. Under the conditions of the tests this coal lost 3 to 5.5 per cent of its heat value in two and three-fourths years' storage, the greater part of this loss being in the first nine months. In general, the lumps became badly cracked, but retained their form sufficiently to permit ready access of air. However, they were weakened so that they broke up badly on handling. By the use of bins with air tight bottoms and sides and a protecting layer of fine slack on the surface, the deterioration of Sheridan coal in heat value can probably be kept below 3 per cent in one year and the physical deterioration can also be largely prevented in the under portions of the pile.

The results show that the amount of deterioration of coal in heating value during storage has commonly been overestimated. With coal such as New River and Pittsburgh the expense of underwater storage equipment is not justified except as a preventative of fires from spontaneous combustion.

Detailed results and a full account of the tests and analytical data are given in the bulletin, which may be obtained free of charge by addressing the Director of the Bureau of Mines, Washington, D. C.

One trouble with waiting until you are sure you are right before going ahead is that there is too much waiting and not enough going ahead.

Burning Clay Wares

by

Ellis Lovejoy

Written for The Clay-Worker.

THE CLAY-WORKER.

PART XX.

Kiln Stacks—(Continued).

Maximum efficiency temperature means that a stack will move the maximum weight of gases at 632 degrees against a fixed resistance equal to the available head at that temperature, which in our problem is 27.5 feet of air, but it does not mean a stronger draft at 632 degrees, because if the stack temperature is 1432 degrees and the draft is satisfactory, we could not increase the draft by chilling the stack temperature to 632 degrees. On the contrary, this would immediately cause the furnaces to smoke for the reason that the 1432 degree temperature is overcoming a resistance of 37.7 feet of air, and if we checked the stack temperature to a point where it could only overcome a resistance of 27.5 feet of air, there would be a resistance of 10.2 feet which the stack could not overcome and the movement of the gases through the kiln would have to be reduced until this excess resistance was eliminated. Chilling the stack gases would have the same effect as excessively lowering a damper.

The rate of combustion would fall off to a degree less than required to maintain the kiln temperature and the kiln would cool. As the kiln cooled the rate of combustion would pick up again but not sufficient to overcome the rate of cooling until the temperature in the kiln is lowered to that degree which it originally had when the stack gases were normally 632 degrees. At this temperature we will have the maximum rate of combustion and we will be moving the maximum weight of gases through the stack. If we were evaporating water, this stationary 632 degree condition would have the maximum efficiency, in other words we could evaporate a greater quantity of water in a given time.

Our periodic kiln burning problem is an entirely different one. At some stage in the burning process we have the 632 degree condition but as the temperature of the kiln mounts higher and higher and the kiln resistance increases in consequence, the temperature of the stack gases automatically increases and necessarily must do so to overcome the increased kiln resistance and approximately maintain the rate of combustion. The rate of combustion falls off somewhat above 632 degree stack temperature but it is of no consequence if we have ample furnace power. Our aim is to get a maximum kiln temperature and to do this we must increase the stack power as the kiln temperature increases, and this is accomplished by increased stack temperature.

Maximum efficiency temperature is readily shown but it is not applicable to periodic kiln burning. It does apply to continuous kiln operation because in such we have constant conditions, fully so in the tunnel type of kiln and approximately in the chambered type.

The following table in the first six columns collects the data which we have already given.

In the seventh column we multiply the total head by the density which gives the weight of gas moved for each temperature. It will be noted that the maximum is at 632 degrees.

In the eighth column we multiply the available head, that is, the total head minus the stack requirement, by the density and get the maximum weight again at 632.

Stack Heads and Weights of Gas Moved.

Stack 2 Feet 6 Inches Square, 60 Feet High.

Temperature.	Vel. Head.	Friction Head.	Total Stack Requirement.	Total Head.	Avail. Head.	Total Head × Density.	Avail. Head × Density.
232	.564	1.354	1.918	13.7	11.8	13.56	9.10
432	.726	1.742	2.467	24.0	21.5	14.40	12.90
632	.888	2.131	3.019	30.5	27.5	14.98	13.50
832	1.048	2.515	3.553	35.1	31.5	14.57	13.07
1032	1.210	2.904	4.114	38.4	34.3	13.82	12.34
1232	1.368	3.283	4.651	40.9	36.3	12.97	11.51
1432	1.531	3.674	5.205	42.9	37.7	12.18	10.71

Stack Furnaces.

Some kiln builders use a small furnace directly connected with the stack to increase the stack intensity. This it does but at the same time it introduces an additional volume of gas and thus uses some of the power which it creates. To whatever extent air enters through the stack furnace, to the same extent is the draft through the kiln lessened, temperature not considered. The size of the furnace is not important, but the opening into the stack should be of such small size that the resistance equals or exceeds the kiln resistance, depending, of course, on the volume of hot gas from the furnace required to heat the volume of gas from the kiln to the desired temperature.

There is a legitimate use for such a furnace in the early stages of the burning when the stack power is very low and yet at the same time we need a strong draft to sweep the moisture out of the kiln during the early stages of water-smoking, and during oxidation when we need a large excess of air for the oxidation.

Two or more kilns on one stack with a flue for each kiln have the advantage that the stack is kept hot and in starting a kiln we have the value of this temperature which the kiln in question could not give during the early stages of firing.

Two kilns should never be connected with a single stack flue.

When we have one kiln connected it has the full power of the stack controlled, of course, by a damper. When we connect a second kiln we rob the first kiln of some velocity of movement of gases through the kiln, since we must divide the volume of gases moved proportionately between the two kilns, and besides the second kiln being cold lowers the available head of the stack. Such conditions are undesirable if for no other reason than the irregularity of the operation.

Height of Stack for Periodic Kiln

Data is lacking to develop any definite rule to be used in the determination of the heights of kiln stacks.

The stack temperature and the kiln resistance are the two items necessary in order to establish such a rule. These can be determined in any operating plant, but the data may apply only measurably to another plant in which the setting is different, offering greater or less resistance, in which a different type of furnace is to be used, in which the quantity of fuel burned per hour is greater or less, in which there is a more or less complicated kiln bottom.

If we had data from a number of kiln operations under different conditions, one approximating the desired condition could be selected and with some corrections, perhaps, could be used, but such data is entirely lacking.

We can get some idea of the approximate height from the following method of calculation. The formula for total stack intensity is, as given,

$$I = H\left(\frac{\text{Wt. of Air} - \text{Wt. of gas}}{\text{Wt. of Air.}}\right).$$

The formula for velocity head is $h = \dfrac{V^2d}{2g.}$

and for friction head, $F = \dfrac{hHK}{S}$.

We wish to determine the height, H.

The problem should be solved for some average atmospheric temperature, let us assume 62 degrees, at which a cubic foot of air will weigh .076 pound. The gas at 32 degrees weighs .087 pound.

Prof. Gale, in a test of a boiler, found the total static pressure to be 0.48 inch water pressure distributed as follows:

Entrance Velocity	0.5%
Grate Resistance	36.6%
Boiler Tubes, etc.	49.5%
Discharge Velocity	3.4%
Flue to Stack	2.4%
Stack Friction	7.6%
	100.0%

Stacks based on a kiln resistance equal to boiler resistance would make it possible to burn the coal at a rate of 15 pounds of coal per hour per square foot of grate surface, which is good boiler practice. The rate of combustion in kiln work is scarcely one-half the rate in boiler work, and if we consider the stack solely from the standpoint of the rate of combustion, the stack heights could be materially reduced.

It must be remembered, however, that the average temperature of the gases in a kiln is much higher than in a boiler equipment and the frictional resistance is greater in consequence, leaving less available stack intensity for the furnace resistance.

A test of a gas burning kiln stack showed .2 inch stack intensity. There was no furnace resistance, but, to the contrary, the gas was introduced under pressure, and this pressure was available to assist in overcoming the kiln resistance. The sum of gas pressure and the stack intensity exceeded .35 inch of water pressure, and the test indicates that a coal burning kiln set with bricks will offer a resistance greater than .4 inch of water pressure.

It also must be borne in mind that during the water smoking and oxidation stages, which are prior to the maximum intensity stage of the stack, there is a large volume of water vapor, and often sulphur-dioxide and carbon-dioxide from the ware, which must be considered. Water vapor being lighter than air increases the stack intensity, but the other two are approximately double the weight of air.

Finally, in the best practice it is customary to partially close the damper during the finishing stages of the burning, thus introducing a resistance which must be offset by less kiln resistance, or, in other words, checking the kiln draft. The stack must be designed for the worst condition of the burning operation, and controlled for the more favorable conditions.

We will not be far astray if we adopt the boiler data for our periodic kilns. The two items of grate resistance and tube resistance total 86 per cent., which in round numbers require a stack intensity of .4 inch of water, plus the stack requirement. This kiln requirement in feet of air will be

$$\frac{.4 \times 774}{12} = 25.8 \text{ feet}$$

The total intensity required will be 25.8 + velocity head + friction head, which will equal

$$H\left(\frac{\text{Wt. of Air} - \text{Wt. of Gas.}}{\text{Wt. of Air.}}\right).$$

If we assume a stack temperature of 1,432 degrees, the second member of the above equation becomes:

$$\frac{076 - 087 \times .284}{.076} \times H, \text{ which reduces to } .675 \text{ H.}$$

The velocity head, as previously determined, is 18.62 feet per second.

The velocity head becomes

$$\frac{18.642 \times .284 \times 1.06}{64.3} = 1.6$$

Note: We wish to determine the velocity head in feet of air at 62 degrees, and therefore the densities as previously given must be multiplied by $1 + .002\,t = 1.06$, because .284 is the density relative to air at 32 degrees, whereas relative air at 62 degrees it will be $.284 \times 1.06 = .301$.

We have already determined the velocity heads relative to 32 degrees and need only to correct these values for 62 degrees, namely, $1.531 \times 1.06 = 1.6$ feet velocity head for 1,432 degrees. For a stack 2 feet 6 inches in diameter, or square, the friction head is

$$1.6 \times \frac{H}{2.5} \times .1 = .06\,H.$$

We now have:

Total stack intensity = .675 H
Kiln and furnace resistance assumed = 25.8
Velocity head = 1.6
Friction head = .06 H

We wish to find the value of H. The last three items

(Continued on page 576.)

POURED JOINTS for VITRIFIED CLAY PIPE

The following strong argument in favor of poured joints of cement grout for vitrified clay pipe comprises the subject matter of an attractive leaflet of the Sewer Pipe Manufacturers' Association, Akron, Ohio.

GOOD results lately achieved with poured joints of cement grout in the installation of vitrified clap pipe indicate that this method is shortly destined to enjoy a very wide favor both for building drainage and in the installation of public sewerage.

The unrivalled permanence of vitrified clay pipe, due to its resistance of chemical and electrolytic attack, coupled with its high tensile strength, has inspired a vast amount of research toward the development of a joint that will be worthy of the high qualities of the pipe.

Advantages Claimed. Therefore the development of the poured joint has resulted from an effort not merely to make a better joint, but one in which the possibility of error through inexpert workmanship was reduced to a minimum. Other advantages claimed for the poured joint are:

Greater uniformity in the quality of the joints.
A denser cement when set.
More rapid operation.
Considerable saving in joint material.
Less need for working space in the trench.
A neater joint.

The Mold. Several forms of mechanical mold for a vitrified pipe joint have been designed and patented. Others doubtless will be improvised.

The form of mold used by the Sewer Pipe Manufacturers' Association in a series of demonstrations is composed of a series of overlapping sheet metal plates, strung on two steel cables of small diameter. When passed around the joint and clamped, it holds the spigot end of one pipe centered in the bell of another, and holds the grout that is poured into the funnel at the top. During the period of setting it protects the bond of the cement against any moderate shock or strain.

This joint is known as the Flexform. It is the invention of Dewitt H. Wyatt, 1672 Summit street, Columbus, Ohio.

Caulking the Joints. After observing all the usual precautions in the support and alignment of pipe in the trench, the first two lengths of pipe are placed in the trench with the spigot end of one thrust well into the socket of the other. The joint should then be caulked with oakum and the oakum compacted with proper tools all around the joint to form a gasket and prevent the flow of the joint material into the interior of the pipe.

Applying the Mold. The mold should first be dipped in oil to prevent the grout from adhering to it. It should then be passed around and under the joint and clamped in such a position that a firm grip is taken on both pipes, with just overlap enough on the socket to insure an even and maximum space for the joint material. The funnel, of course, should be on top.

Sufficient molds should be provided for the entire number of joints, or, in the case of large continuous operations, enough for one day's work. Molds are clamped onto the entire number, before any are poured.

Mixing Joint Material. Cement for the joints should consist of one part by volume of Portland cement and one part clean, sharp sand of medium fineness. It should be mixed with sufficient water to give a consistency of thick cream, similar to the final application of grout filler to a brick pavement. Cement and sand should be thoroughly mixed in their dry state before the application of water.

Pouring the Joints. A little water poured in each mold will insure free flow for the grout. The grout is poured immediately afterward. If grout is of the right consistency and mold properly applied, the leakage of grout at the joints of the mold will be slight. A slight leakage is a safeguard against airholes or water obstruction in the mold. Enough material should be poured to fill both the mold and the funnel.

Removal of Molds. Molds should be left in place from

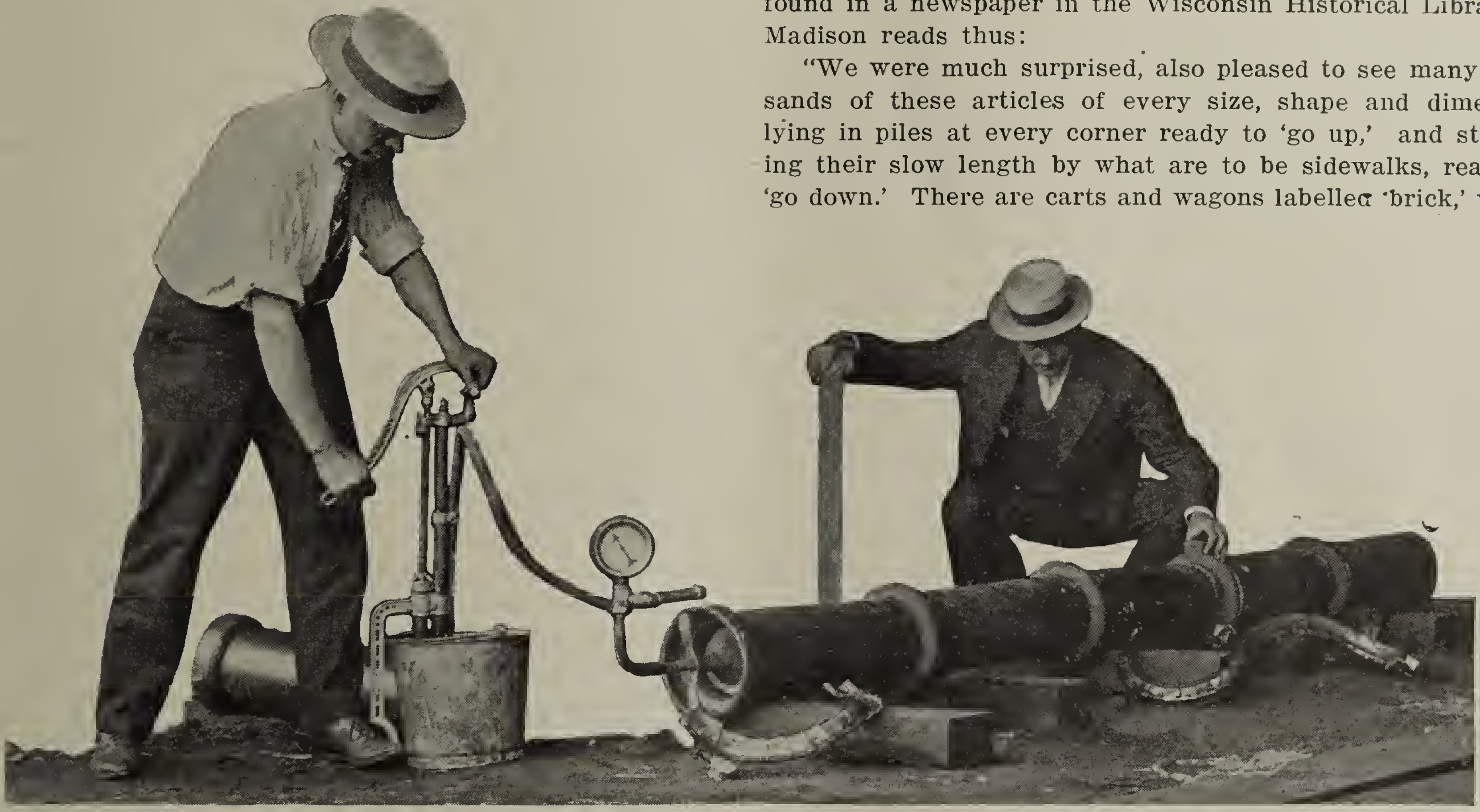
Pouring the Joint

twelve to twenty-four hours to permit the cement to take its initial set. The mold unclamps in such a manner as to split the funnel or hopper into two parts, leaving a protruding jet of surplus joint material, shaped like the funnel. If it is desired to remove these jets, the cement remaining in the funnel should be stirred slightly with a small rod during the setting period, so as to break the set (of the jet only).

Testing the Joint. Where official test of the completed line is required, forty-eight hours should be permitted to elapse before water pressure is applied. Lines of pipe joined by this method have repeatedly withstood pressure four or five times as great as that required by law without so much as seepage.

Contrast of Methods. While hand-troweled joints, made with due skill, have been satisfactory, certain difficulties encountered by inexperienced workmen in the making of troweled joints are obviated in the poured joint.

Use of moist cement in making a troweled joint sometimes results in sagging or running of the cement on the under side of the joint, leaving a slight aperture. Where the trench is immediately filled with earth, the cement is retained in position, but when the trench is left open for subsequent testing of the line, this sagging may be responsible for failure.



Testing Experimental Line with 15 Pounds Pressure to the Square Inch.

Disturbing Previous Joints. In making a hand-troweled joint, there is a liability to disturb joints previously made in the same line, causing the cement to crack while moist, or to cleave away from the pipe. In pouring joints by the above described method, there is no chance to disturb previously formed joints, as the joints are all poured at one time. The clamping of the mold is a further safeguard against safe disturbance during setting.

Unskillful ramming of a hand-troweled joint, particularly where the trench is too narrow for careful work, often results in a failure to fill the joint completely with cement. Pouring of the joint will penetrate to the farthest recess of the joint.

Grout is Impervious. It is also doubtless true that a thinner mixture of cement and sand, up to a certain point, results in a denser cement when set. The liquid character of the mixture permits such an arrangement of the aggregate that the resulting joint is highly impervious. A comparatively stiff mixture, on the other hand, may be porous enough when set to permit a certain degree of seepage. This seepage is not to be regarded seriously from a practical standpoint, as the pores usually fill, under service conditions, and seepage stops; but for purposes of withstanding official tests, there is great advantage in avoiding leaks or seeps of any character whatsoever.

BRICKS FIRST MADE MILWAUKEE FAMOUS.

Bricks made Milwaukee famous long before it became notorious for a certain kind of drink, according to the Monroe (Wis.) Times. Many years before the development of the brewery industry the making of brick had grown to such proportions that it served to advertise the metropolis as the "Queen City of Bricks." An early visitor, reporting his impressions of the city after spending a few days there during the "forties," stated that he readily understood why such a distinguished title had been conferred upon it. This report, found in a newspaper in the Wisconsin Historical Library at Madison reads thus:

"We were much surprised, also pleased to see many thousands of these articles of every size, shape and dimension lying in piles at every corner ready to 'go up,' and stretching their slow length by what are to be sidewalks, ready to 'go down.' There are carts and wagons labelled 'brick,' which haul brick and nothing but brick. Men who have nothing to do or say about brick are not to be found in the Queen City. Do you see two or more men or boys, women or girls engaged in conversation—the subject is 'brick.' If anybody is trading, buying or selling the commodity is 'brick.' Go where you will, you see nothing, hear nothing, feel nothing but 'brick,' 'brick,' 'brick.' "

THEY'LL NEED THEM.

Visitor: "There is considerable criticism against you, Casey. They say that you refused to allow your daughter to join the society for sewing bandages."

Casey: "Oi shure did."

Visitor: "What do you mean by such unpatriotic conduct?"

Casey: "Unpatriotic nothin'. They said they were going to sew the bandages for our soldiers. 'Tis an insult to our men, say Oi. Let thim make bandages for the Germans. They're the byes who will need thim."

THE CERAMIST'S CORNER

This is a department which appears in The Clay-Worker from time to time dealing with practical and technical matters of especial interest to the ceramist. This month we publish the second part of the address by A. V. Bleininger, read before the Institute of Metals, September 25, 1917, at Boston.

NOTES ON THE CRUCIBLE SITUATION.

PART II.

American Bond Clays.

THE QUESTION as to whether clays are found in the United States which approach the Klingenberg clay closely must be answered affirmatively. Whether these clays occur in deposits as uniform in general character as the Bavarian materials cannot be answered definitely. The search for a substitute of the Klingenberg clay as a whole has been somewhat disappointing, and this is not surprising. To my mind it would be far more desirable to use a mixture of clays resembling the Klingenberg material, rather than try to find a single clay which might answer the purpose. Since the German clay itself is by no means a perfect material, owing to its tendency to crack in drying and its somewhat deficient resistence to sudden heating and cooling, it should be our endeavor to find a combination of clays superior to it. This is especially true, owing to the fact that all clay deposits show more or less marked changes at different depths and as the mine or bank is being worked into. For this reason it would be well to follow the practice of the English potters who employ for their compositions a number of clays rather than only one or two. In this manner they are less subject to difficulties due to unavoidable variations and at the same time are in position to correct any deficiencies by the use of materials which show but little change, such as washed kaolin, feldspar, and ground quartz (flint).

In order to illustrate the properties of some of our American bond clays, data obtained in testing them has been compiled in Table III., which may be compared with that relating to imported materials. Considering the great variety of clays found in the United States, it certainly does not seem reasonable that no material should be available which could replace the Klingenberg clay. Indeed we can say that we have clays which can be made to answer the purpose, and new deposits are constantly being found and developed.

Referring to the table, it will be noted that several American clays, such as No. 12, approach the Klingenberg quite closely, but it may also be observed that by the use of mixtures the best results may be expected. Thus, it is quite apparent that a mixture of clays Nos. 4 and 8 should give far better results than either one alone. Clay No. 12 would be improved by the addition of either No. 4, 5, 9, 10, 11, 13, 14, and 15, and vice versa. Similarly, the clays Nos. 6 and 7 would be improved by the last series of clays named. Where the refractoriness of a single clay or mixture needs building up, an addition of Florida or Georgia kaolin would bring about a remarkable change. In making mixtures of any kind, it is essential that the clays be blended intimately by mill grinding; otherwise, the best results will not be obtained. The addition of sand, say 8 to 10 degrees of the total clay and graphite mixture will often improve the standing up qualities of the crucible.

In case one or more of the clays are already silicious, no sand addition is necessary, and in fact may cause trouble, due to checking and cracking. Where a mixture does not become sufficiently dense at the furnace heat, the use of 3 or 4 per cent. of potash feldspar will bring about the desired result.

In controlling the quartz and feldspar contents of the clays the so-called mineral analysis of clays may be of value which determines, though not with scientific accurancy, the percentages of clay-substance proper, quartz and feldspar. For rapidly estimating the content of fine quartz (sand) in clays the use of a small centrifuge with graduated tubes is sometimes quite useful, inasmuch as the volume of those coarser clay constituents may be read off at once.

The clay proposition should, hence, resolve itself into the use of, say, four clays, intimately blended together, which

TABLE III.

No.	Source of Clay.	Per Cent Water Content in Terms of Dry Weight.	Per Cent Volume Shrinkage in Terms of Dry Volume.	Ratio Volume of Pore to Volume of Shrinkage Water.	Time of Slaking 1 Clay 1 Sand Minutes.	Apparent Specific Gravity of Dried Clay.	Modulus of Rupture of 1 Clay 1 Sand Lbs. per Sq. In.	Temperature of Vitrification Degrees C.	Overfiring Temperature Degrees C.	Softening Temperature in Cones.
1	English ball clay..	44.90	43.30	0.79	30	1.69	323	1100	1320	31½
2	Klingenberg, A. T.	39.68	42.58	0.57	78	1.79	381	1125	1450	32
3	Klingenberg, E. T.	50.66	55.05	0.56	108	1.70	363	1100	1450	32
4	Missouri	43.63	43.63	0.72	33	1.72	351	1175	1450	32
5	Kentucky	45.28	34.53	1.05	9	1.55	234	1260	1450	32
6	Ohio	25.30	27.92	0.83	9	1.94	309	1230	1350	30½
7	Ohio	22.08	24.46	0.80	8	2.01	281	1290	1400	31
8	Missouri	34.66	42.63	0.54	117	1.90	554	1175	1320	27
9	Illinois	45.16	45.35	0.65	54	1.67	341	1200	1450	32
10	Kentucky	50.85	46.80	0.71	37	1.57	362	1230	1450	32
11	Tennessee	44.73	35.27	0.97	27	1.56	282	1175	1450	32
12	Maryland	38.91	40.61	0.67	114	1.76	518	1175	1390	31
13	Arkansas	29.02	32.32	0.72	128	1.89	466	1475+	1475+	29
14	Illinois	40.98	38.81	0.75	45	1.66	262	1285	1475	32
15	Mississippi	31.39	31.36	0.81	55	1.81	326	1290	1450	30
16	English ball clay..	40.33	39.85	0.75	41	1.71	389	1100	1425	32

would constitute a standard batch, which should not be changed except for good reasons. We then should forget to worry about the clays and let them alone, though we should inspect shipments carefully. By the use of plastic kaolin and finely ground feldspar and quartz, we could then make such corrections as would seem desirable. Lack of refractoriness should be corrected by kaolin; lack of density or insufficient vitrification by the use of feldspar; and deficiency in resisting the pressure of the molten metal, especially in steel crucibles as evidenced by bulging, by the addition of quartz.

In making up crucibles with 55 per cent. chip and flake graphite, good results have been obtained by the use of 8 per cent. sand and 37 per cent. of a mixture of Maryland, Illinois, Missouri and Kentucky clays, approximately in equal parts. Upon introducing Arkansas clay, which is very siliceous, no sand addition was found necessary and the five clays were used in the proportion of 9 per cent. of each. It is interesting to note that fairly satisfactory results, 17 heats in an oil-fired brass furnace were obtained with the last mixture, but using electric furnace graphite in place of the natural.

The work done by us seems to indicate that in using American clays somewhat higher percentages of bond should be used. Thus, a brass crucible composition consisting of 35 per cent. plastic clay, 45 per cent. chip and lump graphite, and 20 per cent. ground old pots might be changed to 35 per cent. plastic clay, 5 per cent. kaolin, 45 per cent. graphite and 15 per cent. old pot material. Similarly, a steel crucible mixture composed of 55 per cent. graphite, 32 per cent. plastic clay and 13 per cent. sand, might be changed to 30 per cent. plastic clay, 5 per cent. kaolin, 53 per cent. graphite, and 10 per cent. sand. In tempering of crucible mixtures with water, the softer the consistency the better should be the development of the bonding qualities. If it were practically feasible it would be desirable to use so much water that the mixture would form a viscous liquid slip or slurry.

An interesting fact, developed in some work done in this laboratory in the treatment of clays might be promising from the commercial standpoint. In grinding soft lignite with water, the latter assumes a dark brown color, due to the suspension of very fine particles of carbonaceous matter. By using this liquid in place of the ordinary water, taking care to screen out all particles not passing the 120-mech sieve, the bonding quality and toughness of the clay seems to be improved to an appreciable extent. This is somewhat analogous to the well known process of Acheson, depending upon the use of tannic acid to improve the plasticity of clays, but does not have the bad effects of this reagent in the drying of the clay.

The differentiation between crucibles used for brass and for steel melting as to composition is not yet as clearly defined as it might be. All agree, however, that the clays need not possess as low a vitrification temperature but a higher overfiring temperature and greater refractoriness when used for steel melting. It also would be presumptuous to say that we understand all the factors entering into the construction of the crucible body, nor do we understand clearly the various destructive agencies tending to shorten the life of the crucible. The subject is not as easy as it might appear to the uninitiated.

It is obvious that laboratory work along these lines is difficult to carry on without having access to a crucible plant, as the question of workmanship enters vitally into the testing out of the different mixtures. Much is yet to be learned. It is believed, however, that the future will show that the application of ceramic principles, so extensively applied in the production of porcelain and other clay products are of service also in this connection. The American manufacturers of crucibles have been confronted by a serious situation and they have done well under the circumstances, rendered especially difficult by the prevailing strenuous industrial conditions. There is every reason to believe that they will continue to improve their product and still retain the use of domestic raw materials.

In the use of graphite crucibles it is quite apparent to the casual observer that the treatment to which they are subjected is often extraordinarily severe. In the first place it is doubtful whether the function of drying out the crucibles is properly understood. Graphite crucibles are not fired to a high initial temperature and hence retain a porous structure. In common with all other clay products not burned to vitrification the crucibles are hygroscopic, i. e., they greedily absorb moisture from the atmosphere, which is more difficult to expel than we generally realize.

Low fired clays differ widely as to their hygroscopic capacity and the temperature at which they release the moisture thus absorbed. At the same time, the expulsion of this moisture requires considerable time. Therefore, it is not sufficient simply to keep the crucibles in a warm place, but they should be finally maintained for at least several days at a higher temperature, say 300 degrees F. before being placed in the furnace. In Europe the crucibles on being taken from this kiln are sometimes covered with a waterproof coat, such as tar or pitch dissolved in turpentine.

The preheating of the crucible just before putting into the heat for the first time, likewise, is often only too abrupt and hence the temperature change to which they are subjected too violent. The ideal method of handling the fresh crucibles would be to place them in a special furnace kept heated by the waste gases of the melting furnace, where the temperature could be brought up uniformly to somewhere below red heat.

ORGANIZATION OF NEW YORK STATE BRANCH OF THE AMERICAN CERAMIC SOCIETY.

A meeting was held in Hornell, New York, on November 19th and 20th for the organization of a New York State Branch of the American Ceramic Society. This was in response to the request of the Membership Committee of the A. C. S., which is pushing a vigorous campaign for new members and stimulating interest in the society. The committee is obtaining opinions and circulating information regarding several changes in the policies of the society, all looking toward a larger, better and more active Ceramic society. The division of the country into nine sections and organization of a local section of the parent society in each section is one of the things the committee hopes to have accomplished before the annual meeting in February.

The New York Section was the first to carry out the organization. The meeting in Hornell was well attended by members from every section of the State. The New York State Branch organized on Monday, November 19th, elected the following officers for 1918:

President—L. E. Barringer, Schenectedy.
Vice-President—Frederick Carder, Corning.
Secretary—J. B. Shaw, Alfred.

It was decided that a meeting should be held quarterly, the next meeting to be called in May at either Syracuse or Schenectady. On Tuesday the following program was carried out, all the papers being of a high character, fully up to the standard of the A. C. S.

Effect of Time of Smelting on the Nature of Enamels, E. P. Poste.

Casting Heavy Clay Products, F. H. Riddle.

Refractories, Raymond M. Howe.

Chemical Porcelain, C. F. Binns.

There is an organization in New York State known as the New York State Ceramic Products Manufacturers' Association and it seems likely that that organization will disband and affiliate with the new one. Some action was taken looking toward this at the meeting and letter ballots have been submitted to the members to decide the question.

J. B. SHAW.

BOOSTING THE BRICK BUSINESS.

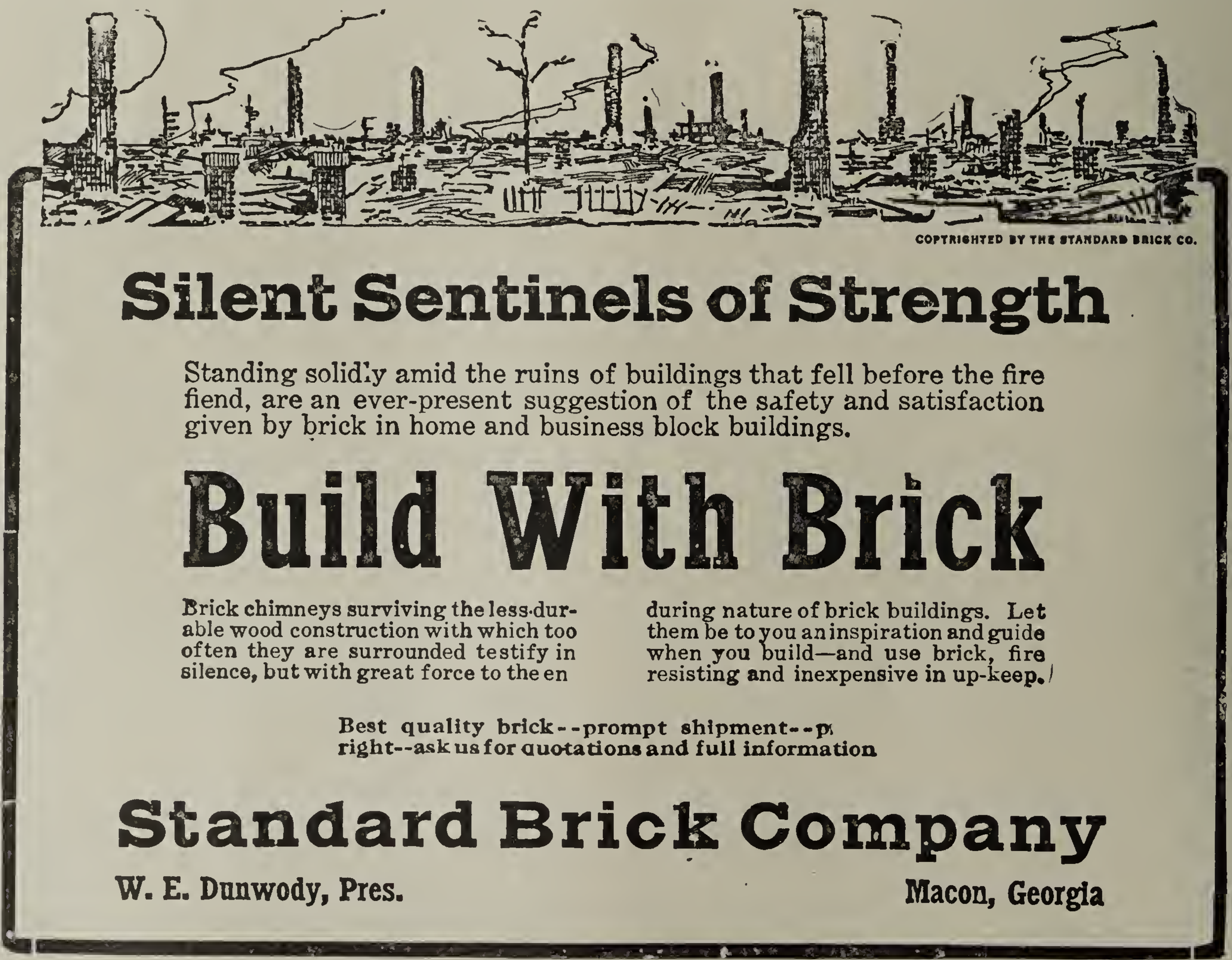
The Need of Exlpoitation; What Others Are Doing and What You Can Do to Promote Increased Sales.

THE CLAY WORKER is and always has been interested in any and every proposition calculated to boost the brick business. We may have a difference of opinion sometimes as to details or how a given effort at boosting had better be directed, but boosting the business is always a part of the business of the clayworker, and right now there is seemingly a call for special attention to this subject. There is an easily apparent need for extensive boosting of building brick, especially to encourage a wider use of this product in building operations during the coming year.

There is both a science and psychology of advertising, or any boosting propaganda, or perhaps one might better say that the science of advertising embodies a consideration of psychology as well as an analysis of efficiency and other factors which enter. The natural disposition of humanity is to let-up on advertising when business is good, because it is not needed, and to refuse to do advertising or exploiting when business conditions are bad because they are afraid it will not be effective. There is so much of this latter tendency at the present time, so much of the feeling of "What's the use, building operations are going to be slow anyway" that it makes a special call for exertion to counteract the natural tendency.

The fact of the matter is, there was never perhaps a better time to map out extensive campaigns of exploitation, for both brick and clay working machinery than right now. You don't see the automobile people cutting out their advertising because of war conditions and war demands curtailing the possible demand for pleasure vehicles. Neither do you see the real enterprising automobile concerns cutting down on their advertising and exploitation at times when they are full with orders, for they realize that there is a business of the future and they must persistently keep their name and their product before the people. Moreover another thing that you can readily notice is that those things which are actively exploited in the advertising pages of the leading magazines of the country are not only the things that become conspicuous in the public mind but they are things in which big business is being done at the time. The big business largely results too from advertising, or exploitation of one kind and another.

The only conclusion that can be drawn is as plain and solid as a brick wall,—it is that the way to help the brick business along is by active exploitation. Even if we accept without question the idea that building operations are to be restricted during the ensuing year on account of war there is room to extend materially the quantity of brick used in what building operations are carried on by keeping the mat-


COPYRIGHTED BY THE STANDARD BRICK CO.

Silent Sentinels of Strength

Standing solidly amid the ruins of buildings that fell before the fire fiend, are an ever-present suggestion of the safety and satisfaction given by brick in home and business block buildings.

Build With Brick

Brick chimneys surviving the less-durable wood construction with which too often they are surrounded testify in silence, but with great force to the en during nature of brick buildings. Let them be to you an inspiration and guide when you build—and use brick, fire resisting and inexpensive in up-keep.

Best quality brick--prompt shipment--p right--ask us for quotations and full information

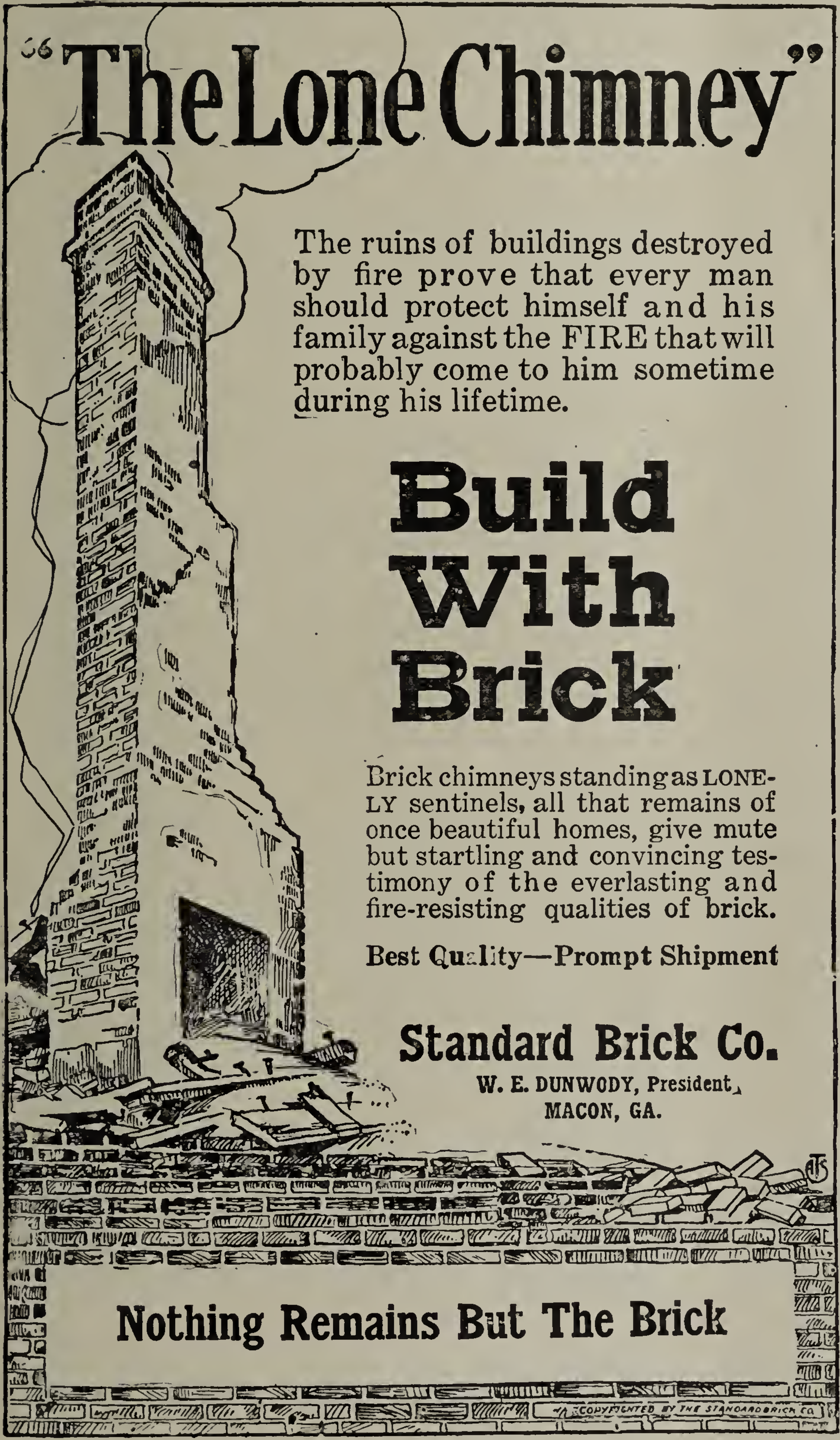
Standard Brick Company

W. E. Dunwody, Pres. **Macon, Georgia**

A Forceful Argument in Favor of Brick as an Everlasting Building Material.

ter before the building public. There is plenty of room to materially enlarge the building brick business even if general building operations are curtailed, by impressing the public with the advantages to be had from using brick in lieu of flimsier and less permanent building material.

This is a line of thought that has been given effective attention by the Standard Brick Co., of Macon, Ga., which has put up some solid arguments for brick in advertising form, using as an illustrative object lesson pictures from the great Atlanta fire. These in some instances are shown standing as silent sentinels of strength to brick. Again a lone chimney will be shown among the ruins of buildings destroyed by fire, the chimney giving mute and convincing testimony of both the fire resisting and the permanent qualities of brick. Moreover there is no doubt but that they benefit from it personally. Also while they benefit directly from this kind of forceful advertising it is in a way a benefit to the entire brick industry because others in other localities read about it, are told about it, and gradually the thought is extended that brick is the one best bet for building purposes. What we need is more of this kind of stuff. Every brick man everywhere in the country should be doing his share of advertising, and to round it all out properly all should contribute to a central fund for some general advertising so that the work may be kept up systematically all over the country and general advertising supplement that of the individual.


"The Lone Chimney"

The ruins of buildings destroyed by fire prove that every man should protect himself and his family against the FIRE that will probably come to him sometime during his lifetime.

Build With Brick

Brick chimneys standing as LONELY sentinels, all that remains of once beautiful homes, give mute but startling and convincing testimony of the everlasting and fire-resisting qualities of brick.

Best Quality—Prompt Shipment

Standard Brick Co.
W. E. DUNWODY, President,
MACON, GA.

Nothing Remains But The Brick

Another Effective Advertisement Used by the Standard Brick Co., Macon, Ga.

Advertising properly considered is an investment. To make a homely application, and a specific illustration, let us take clayworking machinery and appliances. Those who have these things to offer to the clayworkers argue logically that the clayworker doesn't necessarily spend money for them, but invests money in them, and may expect to get good returns for his investment. Now just as surely as money properly expended for machinery is money invested rather than money spent, so money used for properly advertising clayworking machinery to the industry is money invested and not merely an expense.

It is easy enough for the clayworker looking on to understand and appreciate the logic of this kind of argument, but while the brick man will admit the logic of the argument just as the machinery man will, he ,like the machinery man, when it comes to planking down money for advertising, too often still retains way down in his heart a feeling that an advertising appropriation is a burdensome expense instead of a profitable investment. Now, just so long as people feel this way it is difficult to drive home to them a proper realization of the established fact that advertising is a profitable investment and not a burdensome expense. Moreover, the problem is how to convert or convince the people themselves that advertising is worth while and should be done is often much more difficult than the other problem of how to conduct an advertising campaign to get the best results.

We have around us all the time big shining examples of what advertising exploitation can do, and right now it seems that we need to take note of these things and to become inspired with the essential importance of more active boosting of the building brick business during the coming spring. Not only to the end that the brickmaking industry may prosper, but also that in its prospering there shall be developed a better and more satisfactory order of building all over the country. The United States is setting an example to the world now in many things, in the making of soldiers, in the conduct of the war, in the building up of a merchant marine, and export business. And one of the most impressing things to many of the throngs of visitors coming here from other countries on various missions is our homes, the substantial and comfortable nature found in the homes of the average people. This is one of the things in our national life that we are proud of and we can be still prouder of it by improving the home life and home surroundings further through a more extensive use of the brick and clay products in building operations.

It is time for us to set a shining example to the world in the clayworking industry as well as industries of war by organized and individual exploitation of brick and clay products such as we have never undertaken before. Individuals here and there and local organizations in various parts of the country, and some organizations of wider scope have taken the matter up and done some good effective work, and some are planning still more. Let us lend encouragement to all of these which come within our scope, and all around let us take up the matter of boosting the brick business more thoroughly and enthusiastically than ever before, for in the end it will prove a profitable investment rather than a burdensome expense as too many are inclined to regard it.

IT IS WORSE THAN FOLLY TO USE SLOW, COSTLY ROAD METHODS.

THE scarcity of labor and the high cost of living are the continual topics of conversation, no matter where we go. The labor situation has been growing steadily worse on account of the large production of manufactured articles necessitated and demanded of the United States to take the place of the curtailment of similar European industries. Raw products are also demanded in larger quantities to supply the added material for manufacture. These conditions have created a heavier demand on all labor, which, coupled with the practical cessation of immigration and the recalling of many foreigners to their home countries to serve in the army, have combined to seriously deplete the supply of what is ordinarily called unskilled labor.

The economic law of supply and demand has immediately asserted its power in raising wages. This is also aided by the constant increasing cost of living. From the viewpoint of the road contractor, whose success depends upon the supply and cost of labor more than any other factors, the present conditions are most deplorable. Where it formerly was possible to have an ample supply at all times and to refuse applicants for jobs every day, the contractor now has to search all sources for men, arrange special convenience, and make extraordinary concessions with regard to pay days to attract labor and to hold men on the job after securing them. As an example of what the contractor must face, laborers formerly plentiful and satisfied with $1.75 per day, now are restless and scarce at $2.50 per day, and moreover much less efficient for work requiring a slight amount of skill.

The gravity of the situation has led to the adoption of as much machinery and labor-saving devices as possible, not alone for the saving effected in cost, but in order to be sure that the work will be done on contract time, which might not be the case if he were to remain absolutely dependent upon scarce and restless labor.

A contractor on a piece of road in Pennsylvania last year completed his section of the road on time at less cost by the adoption of labor savers, while brother contractors on different sections of the same road who depended upon hand labor found the cost very high, were hindered by the labor shortage, and unable to finish their contracts within the time limit.

This contractor used dynamite to blast outfall drainage ditches, a steam shovel in all cuts, using low strength dynamite to loosen the ground and speed up the action of the shovel, and automatic dump wagons to haul out the earth. The other contractors dug many of the ditches by hand and used pick and shovel, plow and hand shovels in digging and loading the earth in cuts.

In many instances the size of the contract or the depth of cuts will not permit of the employment of a steam shovel, but in these cases the use of plows and dynamite to loosen the material and of wheeled scrapers for hauling on short distance work will effect a saving.

The contractor should make a careful study of conditions that we may encounter and lay his plans accordingly. All work possible should be done by labor-saving devices. What may seem a heavy initial expenditure for equipment will very probably prove to be a wise investment before the contract is completed. It is worse than folly to use slow, costly methods.

BRICK CONTRACTING.

A SPLENDID job of winter work for the brick fraternity to devote itself to would be that of getting up and distributing a series of handbooks on how to estimate brickwork and do brick contracting. The idea of these books is that of encouraging education and development of brick contractors. There are easily ten carpenter contractors in the country where there is one brick contractor and so long as these conditions hold there will be a natural tendency to build with lumber rather than brick. Brick building will never become the common practice it should be until we have more people interested in and educated up to doing brick contracting, just as we have a big army of people today who do carpenter contracting.

It is an odd fact that most of the brick contracting of the country is actually done by carpenters, who by training in preference are woodworkers, but from necessity must figure on brick work now and then. These could be encouraged to a wider interest in brick work by being supplied with handbooks of information on estimating and the details of the work, and at the same time the younger men in the trade would be encouraged to give more attention to the subject of brick building.

The lumber industry has been very industrious along such lines. There are handbooks of all kinds in connection with lumber and building contracting involving lumber. The lumber folks even get the co-operation of the government and various state forestry departments which compile books on Farm Mechanics and Farm Home Building, and these books contribute much to encourage the use of lumber.

We all understand the need for more things of this kind in connection with the brick and clayworking industry, and nearly every man in the brick business is ready to seize eagerly any opportunity to procure something of this kind for local distribution. What we need, therefore, is some concerted effort on a larger scale by the industry as a whole during the winter to make available literature of this kind to the individual manufacturers for local distribution.

This is a winter in which building operations will be rather limited and business in building brick will be somewhat restricted. Therefore, there should be more time that can be devoted to the work of getting out books on brick contracting, and there is certainly a need for it to the end that we may encourage a wider use of brick when building operations are resumed in spring.

More brick contractors are essential to the better progress of the city in building operations and the time is here when the trade should turn seriously to the task of providing means for educating and developing a great army of brick contractors.

Written for The Clay-Worker.

CLAY NEWS FROM DIXIE LAND.

THE BRICK DEALERS and manufacturers, contractors and architects in this section have not had such a bad year after all. Considering that war conditions have been on, there has been a wonderful amount of building going on. Paving has been a considerable item, remodeling has been a big item and many new and large apartment houses, many garages, public schools, churches, residences and stores, opera houses and office buildings stand to the credit of 1917. The military camps used little brick work, but some brick and clay materials entered into these and in some communities much durable work has been and will be precipitated thereby, though, to be sure, this factor can not be counted like other building development.

The various pottery and clay shipping interests in Tennessee and Kentucky have had a splendid year and in the midst of December, on the eve of the holidays, are in a struggle for cars in the latter instance, seeking all the available labor at good prices and in the former instance having a sharp and splendid demand for their jars, jugs, vases and pottery goods. The drain tile people, in the midst of alluvial land projects, draining of swamp lands, building of canals and good roads, are in a third class reaping the benefits and looking bouyantly into 1918.

The Bransford Realty Company at Nashville, Tenn., are about to erect a brick and concrete warehouse at 125-7-8 Eighth avenue, North, Nashville, estimated cost $60,000.

The Johnson-Porter Clay Company, with offices at McKenzie, Tenn., and mines in Carroll and Henry counties, have materially added to their working force and from the mines near Hico, Tenn., are shipping carloads of clay almost every day.

The Harley Pottery at Nashville is active and their traveling force through the southeast are sending in much business.

The Paducah Pottery, at Paducah, Ky., that suffered a fire loss some weeks ago, has been restored and shipments on the eve of the holidays are active with this company.

The sewer pipe tile companies at Union City and Rives, Tenn., have been busy this fall and are furnishing the drain tile for much of the farm and bottom drainage work going forward in West Tennessee on a large scale.

The Memphis Brick Supply Company is furnishing the brick for a number of bungalow residences and several public structures going up in the city of Memphis.

The Eagleville Brick and Tile Company of Eagleville, Tenn., has been incorporated. Capital Stock, $10,000. Incorporators, J. E. Jackson, L. H. Lovelace, William Ralston, D. H. Hughes and John D. Wiseman; to manufacture brick and tile.

Elry Sparks, formerly on the road as traveling salesman for, and a son of the proprietor, C. Sparks, of the McKenzie (Tenn.) Pottery, is now in the service of Uncle Sam as a soldier at Camp Sevier, Greenville, S. C. He is a member of Company F, 117th Infantry.

The Builders' Exchange of Memphis held a social meeting Thursday night, Dec. 6, at the Exchange quarters in the Goodwyn Institute Building. Phil M. Canale was on the programme to speak on "Americanism;" Harry N. Howe on "Build Now." Members of the entertainment commiteee are Clarence DeVoy, Joseph Fowler, E. F. Dowling and W. A. Powell.

The contract will be let this month for the new postoffice building at Decatur, Ala. The lot selected is on Oak street. Recently $75,000 was appropriated for the building and lot.

The Fulcher Brick Company at Nashville is finishing up several large contracts in Nashville and reports outlook good for 1918. The firm is furnishing brick for a big college building at Clarksville, Tenn.

A. J. Cook & Co., building material dealers of Memphis, have the contract for considerable of the material to be used in the construction of a big levee north of Cairo. Messrs. Cook and Fraser say that the year closing has been a good one with their firm. They have supplied the material on many homes and business houses and are handling on their yards in North Memphis sewer pipe, fire brick, clay fireproofing and a full line of building materials.

Mrs. L. P. Carnes, of Nashville, Tenn., will have erected a brick garage at 1400-1404 Broadway. Estimated cost, $20,000.

Plans are being drawn for the three-story Carnegie Library building, to be erected on the Peabody Campus at Nashville, on the Hillsboro road, opposite Garland avenue. The contract for the building has been let to Foster-Creighton Company of Nashville. The structure will cost about $180,000. It will be capable of accommodating 200,000 volumes. Edward L. Tilton, of New York, was recently selected as the architect.

DIXIE.

Written for The Clay-Worker.

THE SILO.

By M. R. Ellis.

If you only knew the value
Of the Silo as a bin,
You would hasten now to build one
Just to store your feed within.

For a sweet and juicy ration
To the cattle on the farm
Will bring both health and gladness
And will never do them harm;

If 'tis put up in a Silo
That you well and staunchly build,
It will stand the storm of winter;
If 'tis full and wisely filled,

It will keep all kinds of silage
From clover down to beans;
You can store your peas and fodder,
Use most any kind of greens.

Just chop fine all your fodder
And your turnips and your kale,
Throw in any kind of corn stuff,
And Alfalfa by the bale.

Then turn on a stream of water
As your labor your pursue,
And pack it all most firmly,
The results will stagger you.

Then build yourself a Silo,
Don't wait another night,
But build with care and judgment
And make it close, jug tight.

For sure 'twould be a pity
For your Silage all to waste,
Then use a burnt clay segment,
And you can't make too much haste.

"A fireplace with a fire in it is the glowing heart of a house, and a chimney completes it and reveals that it is a home fit for human creatures to live in."

Written for The Clay-Worker.

SOUTHERN INDIANA BRICK NEWS.

TRADE WITH THE BRICK manufacturers in Evansville and other southern Indiana has been rather slow for the past month and indications are that there will be no marked improvement until after the first of the year, and perhaps not until the early spring. The Evansville brick yards are running steadily whenever they are able to get full crews. There is a shortage of labor and, in fact, has been for some time, as many of the working people in Evansville have been called to the colors. The car shortage is also bothering the brick manufacturers in southern Indiana towns. A number of instances were reported of late where manufacturers were unable to get cars after they had received nice orders for brick. It is not believed the car shortage problem nor the labor shortage problem will improve much until after the winter has passed. John Andres, secretary and treasurer of the Standard Brick Manufacuring Company of Evansville, says that when everything is taken into consideration that trade is about as good as one could expect. He is not pessimistic over the outlook and says the thing for the manufacturers to do now is "to sit steady in the boat and meet all new emergencies as they arise from time to time." Mr. Andres says the car shortage is quite a serious one and is very unfortunate, coming at this time, when other conditions are anything but normal. The Standard Brick Manufacturing Company will furnish the brick for a modern garage building at Carmi, Ill., to be built by Elliott & Endicott. They will also furnish the brick for a new apartment house in this city, to be built by Charles A. Erskine, flour manufacturer and state senator. The house will be built on Riverside avenue. A new store building is also being erected on the West Side in this city and the Standard Company is also furnishing the brick for that job. Mr. Andres says that it is to be expected that trade should be a little off at this season of the year. He looks for conditions to remain abnormal until after the war and after peace has been declared he is of the opinion that the United States will forge ahead by leaps and bounds and that general prosperity will abound in the land.

Samuel L. May, a well-known government contractor at Evansville, is planning to build a new summer home that will cost $25,000 or more, and it is expected that the brick for this job will be furnished by the Standard Brick Manufacturing Company.

The potteries in Evansville report a good trade and most of the plants are being operated on steady time. The car shortage is affecting the potteries some, the same as other manufacturing plants, and many of their shipments have been delayed of late because of this.

Henry Kleymeyer, general manager, and John Andres, secretary and treasurer of the Standard Brick Manufacturing Company, attended the national convention of the American Face Brick Association at French Lick, Ind., on December 12, 13 and 14, and had a good time.

John Andres, secretary and treasurer of the Standard Brick Manufacturing Company at Evansville, probably will be reappointed a member of the water works board of that city by Mayor Benjamin Bosse. He is a most capable public official and Mayor Bosse could do no better than to keep Mr. Andres on the job.

John W. Harl, a well-known potter at Evansville, died at his home in that city on December 5, after a short illness. He was forty-four years of age and is survived by several brothers and sisters.

A few days ago the Bippus Tile Company, of Huntington, Ind., made an appeal to C. B. Williams, the county fuel administrator, for fuel to continue the operation of its plant.

Ernest Blake, foreman of the Rockport Drain Tile Company, at Rockport, Ind., has moved to Cloverport, Ky., and has made arrangements to go to farming on an extensive scale.

Henry Clements, manager of the Cannelton Sewer Pile Company at Cannelton, Ind., and formerly mayor of that city, was a recent business visitor in Evansville.

The Southern Clay Products Company, of Huntingburg, Ind., has just completed the shipment of a number of carloads of brick to New Albany, Ind., that are to be used by the fire department of that city in the construction of a fire engine house that was destroyed by a tornado last March. The quality of the clay and process of manufacture places this company's product in great demand by contractors and they are gaining a reputation all over the country. Huntingburg has two brick manufacturing plants that have a high rating in the manufacture of a first-class product. Both plants have been fairly busy all fall and winter.

Work is progressing nicely on the construction of the new brick streets at Grayville, Ill., a live city a few miles west of here. They will be the first brick streets built in Grayville.

Mayor Benjamin Bosse of Evansville is president of the Dixie Bee Line Highway Association that has for its object the building of an improved highway from Danville, Ill., to Nashville, Tenn. Some of this proposed line in Knox county, Ind., was built of brick, this being the first brick road to be constructed in Knox county. The road is well worth the investment and the public appears to be highly pleased with the construction. The building of brick roads in this section is expected to be done more and more from this time on, as it is admitted on all sides that no material for road building can beat brick. It is hoped that some of the highway from Evansville to New Albany, Ind., and to be known as the "market highway," will be built of brick, as well as the proposed highway from here to French Lick, Ind., which road has the approval of the Indiana State Highway Commission. Road building, or better roads, are getting more popular all the time in this section of the state. For years southern Indiana was regarded a little slow about waking up to the importance of this problem, but business men and farmers now realize that good roads are among the best investments that can be made. Brick manufacturers here are boosters for good roads in and out of season.

A HOOSIER.

ARMY NEEDS BRICKLAYERS.

Call Sent Out by Signal Corps for Men to Build Airdomes in France.

Bricklayers to build the great American airdomes which will house America's new flying army overseas are needed in large numbers by the Signal Corps. Telegraphic instructions were sent from here to every recruiting officer in the country to enlist as many men as possible for this service.

The men immediately after enlistment will be sent to a large concentration training camp in the South, where they will be organized into squadrons for immediate shipment to France.

All men wishing to enlist should apply without delay to their nearest recruiting officer. Men within the draft age must apply before Friday, when the new law goes into effect, preventing men between twenty-one and thirty-one from volunteering. A large number of the men will be made noncommissioned officers. The salary will run according to rank from $30 to $51 per month with food, quarters and uniform provided by the Government, and 20 per cent. extra for foreign service.

Written for The Clay-Worker.

KANSAS CITY BRICK AND BUILDING NEWS.

WHILE the building permits issued at Kansas City during the past month have not been as great as those issued a year ago, they show a nice increase over those of the previous month, which indicates that building is gaining considerable. This fact may be attributed in a large measure to the influence that the real estate board of Kansas City has. Members of the board recently annnounced that there was an impending scarcity of rental property and that if more buildings were not erected during the winter months the scarcity would be keenly felt at the spring of the year, when the average influx to Kansas City is estimated by the board to be approximately an increase of ten thousand in population. The board displayed the fact that there was a big demand for apartments and as conclusive evidence that the influence of the board has been felt here, it is noticeable that the larger percent of the permits that have been recently issued by the city have been for apartments. Now the brick manufacturers and selling companies have come strongly into their own in this regard through the slogan "build with brick," and again it is noticeable that more than 90 per cent of the apartments being erected are to be of brick construction.

According to men engaged in the storage of household goods, this business has increased very largely during the past few weeks. A number of the new concerns that have recently erected fireproof structures for the handling of this business have had all that they could possibly handle. The new storage and warehouses have built with brick. From a recent interview with warehousemen, a representative of the Clay-Worker, found that in this particular business, requiring fireproof structures, brick is considered the best fireproof construction possible to secure. At the present time there are only two warehouses in the city of any importance that are not considered fireproof and all the fireproof houses in the city are constructed of brick.

The new building code which a special committee has been working on now for more than six months has been finally completed and has been submitted to the city council. It is likely that the council will announce its acceptance or rejection within the next few weeks. The new code will contain many new features that the old one does not have.

The brick manufacturers and selling companies at Kansas City report that the business has been extremely good for the season of the year and considering the difficulties under which the country is now laboring. The price of common brick reached a high level here during the month of October and November, when it was quoted almost universally at $11.50 per M. and $11.75 per M. Several dealers announced that it would possibly go even higher than that during the next few weeks. The increase in the price of brick, both common and face, and also in hollow building tile, came as a result of the coal shortage in this district. Several plants were forced to close entirely for a period and others were able to operate only a portion of the time. With the total output of the different plants almost entirely sold, this created a shortage upon the market here, which was further handicapped by the shortage of railroad cars for shipping. The dealers and manufacturers declare that the railroad companies are largely responsible for the conditions being as they are, declaring that train after train has been called from the service in an effort to lower the operating expenses of the railroads. This has resulted in less competition between the companies and the fact that now one engine does the work formerly done by three, for where three engines hauled three trains, one engine now pulls one big train. The waste of time in shipments has been a serious handicap, almost rivaling that of the coal situation.

One of Kansas City's Fireproof Brick Warehouses.

Some of the plants of the Western Paving Brick Manufacturers' Association, which has offices at Kansas City, were tied up part of the time during the past two months, because of the fuel shortage. Several of the plants had a good supply of coal on hand and were thus enabled to operate a portion of the time, but others lost several days, due to the fuel shortage. The plants of the association have orders on hands for nearly their total output of the next six months to come, the bulk of the business being in the southwest and to the immediate south of Kansas City.

The big Liberty Day parade, which was given for the purpose of creating greater enthusiasm in the second bond issue, was the largest parade that Kansas City has ever witnessed. All stores and manufacturing plants shut down for half a day in order that all employes could participate. The marchers were divided into trade groups. Fred L. Dickey, of the Walter S. Dickey Clay Manufacturing Company, headed the brick and tile division.

H. H. Crowell, sales manager of the Hydraulic Press Brick Company at Kansas City, announces that the trade has been very good, considering the circumstances which surround it. Mr. Crowell recently said that it was his belief that building would make rapid progress during the spring months and that at that time the demand for brick would be extremely heavy. The company has had several good orders of late, and is furnishing the brick for many new apartments that are being erected.

The plant of the Walter S. Dickey Clay Manufacturing Company at Kansas City has been operating close to capacity during the past two weeks. However, the coal problem affected the operations of the company during the earlier period. The company was enabled to operate close to its daily capacity, however, nearly all of the time.

The plant of the Fulton Fire Brick Company at Fulton, Mo., was recently closed for a portion of the time because of the fuel shortage in this district. The company announces that the plant will resume operations as quickly as the needed supply of coal can be had and some promise of future deliveries being made.

It was recently announced by the Kansas City Brick Company, whose new plant at Vale, Mo., was recently completed, that the plant would soon begin operations and that it was extremely likely that a selling office would be maintained at Kansas City.

Because of the effect of the coal strike in the Illinois fields, the fire brick plant at Mexico, Mo., was recently ordered closed by its manager, John Long. Mr. Long said in this connection that unless the coal situation was quickly adjusted his men would be used in developing nearby coal fields. He pointed out that the high prices made it not only imperative that the men be at work, but also that the teams must be employed because of the increased cost of grain. The clay mines at Montgomery, Mo., were ordered closed at the same time the Mexico brick plant closed. The mines are not expected to be opened until the brick plant can resume operations.

THE WAR-SAVING PLAN IN BRIEF.

The war-saving plan provided for in the bond act of September 24, 1917, goes into operation Monday, December 3. Government certificates of indebtedness are to be sold in two denominations—thrift stamps costing 25 cents each and war-savings stamps costing from $4.12 to $4.23, according to date of purchase.

When $4 worth of thrift stamps are obtained a war-saving stamp can be secured in exchange for them by paying the difference between $4 and the current price of the war-savings stamp.

War-savings stamps can be purchased for $4.12 during the months of December, 1917, and January, 1918, but will cost 1 cent more for each succeeding month in the year 1918. They are redeemable on January 1, 1923, for $5, which amounts to 4 per cent. on the amount invested, compounded quarterly.

Although these investments do not mature until January 1, 1923, on ten days' written notice after January 1, 1918, such certificates will be redeemed by postmasters at their cost to the purchaser, plus 1 cent a month on each war-saving stamp. The thrift stamps do not bear interest.

The stamps and certificates can be obtained from postoffices, banks or trust companies, at most railroad stations, stores, factories and many other public places.

Written for THE CLAY-WORKER.

PACIFIC COAST NEWS.

The GENERAL SITUATION in the clay products industries shows no change from a month ago. As far as common brick is concerned, the situation is not good, as the shortage of cars hits this branch of the industry particularly hard. So far, no one has been able to include common brick in the list of the war needs. In this respect the fire brick are in a much preferred position, and it is reported that assurances have been made that the shipment of fire brick will be facilitated as much as possible by the government. Whether or not such information is official, the fact remains that the makers of common brick are having the greatest difficulty in getting cars and the fire brick men are complaining very little on this score. The price of fire brick was increased in this market on December 1 from $32.50 to $35.00. The increased cost of labor and other expenses are given as the reason for this increase. The common brickmakers will follow this lead on the first of the year and increase the prices of their product from $10.00 to $11.00. As a whole, the year just drawing to a close is regarded as satisfactory to the whole industry, excepting to the common brickmakers. The falling off in building operations, the increased cost of labor and difficulty of shipping their product have conspired to make these manufacturers feel that they are not getting a fair share of the business due them.

On the other hand, the fire brick men are well pleased with their year's work, the tile and sewer pipe men have lost two active competitors, temporarily, by fire, and the remaining makers have been kept busy taking care of orders. One feature of the trade which has had a remarkable success is the magnesite people. This business has grown to important proportions since the European war broke out and during the past year has doubled the previous year's output. In July the Western Magnesite Association was organized for the purpose of advancing the interests of those interested in this product. The production for the past year in this state will be well over 300,000 tons. About half of this was calcined here and then, with the crude ore, shipped to the East. The value of this output is placed at more than $4,000,000. Some idea of the advance that this industry has made since the European war broke out can be seen from the statement that in 1913 a total of 9,632 tons, valued at $77,066, was produced. Due to the cutting off of foreign imports in 1916, the production jumped in this state to 154,974 tons, valued at $1,393,693. This production is steadily increasing as the large producing mines are becoming more thoroughly developed, and the more productive veins lying at the lower levels are reached. With this prospect it is estimated that 1918 will show double the output of this year. One of the objects for which the Western Magnesite Association was organized is to bring this industry to the attention of congress, with the hope that a protective tariff may be passed before the end of the war allows the re-entry of foreign ore. The industry in California employs nearly 1,000 men, with a payroll of over $1,000,000, and the freight paid the railroads this year to carry both the crude and calcined magnesite east amounted to over $2,500,000.

The Refractory Magnesite Co., of which Frederick R. Turton is president, is one of the few important magnesite companies not represented in the Western Magnesite Association. Mr. Turton is the only magnesite producer who is actually making bricks in California. By an arrangement with the Stockton Fire and Enamel Brick Co., Mr. Turton is turning out a considerable number of brick every month. He says that his product is the only one in the state so far discovered which will make brick without being "doctored," that is, without the addition of some foreign matter. His bricks seem to stand up well in the furnace and Mr. Turton claims he has letters testifying that they have stood for five months in copper furnaces in Utah and elsewhere.

The Stockton Fire & Enamel Brick Co. has moved its San Francisco office to 915 Rialto building, where John T. Roberts, its manager, finds more room to conduct his expanding business. Mr. Roberts says that he finds business very satisfactory. His plant is producing nothing but fire brick.

The Livermore Fire Brick Works is putting in two new muffle kilns for the purpose of burning enameled brick and terra cotta.

M. J. Mealey, J. L. Collins and O. I. Morton have just incorporated the San Francisco Brick Builders Co.

The Terra Cotta Products Co., has recently secured a permit to sell securities for the purpose of enlarging its plant at Telco, Cal. The company is turning out 60,000 feet of 4-inch drain tile monthly. With the new equipment which it plans to install it will greatly increase this capacity and will add to its output tile of every description.

C. E. Berg, president of the Port Costa Brick Works, has just returned from an extensive trip East, where he visited the brick plants and manufacturers. He was away about a month. His trip was especially to decide on the type of machinery he desired to put in at the Port Costa plant, where new drying and other machinery is to be installed.

G. H. Tefft, of Chicago, is in San Francisco on a business trip. While here he will attend the annual meeting of the Pacific Clay Products Association.

The largest system of tile drainage ever let in northern California is now being installed near Gilroy by Engineers William Johnson and Henry Fisher of San Francisco in charge. The work is being done on a section of about 500 acres, on most of which the water level is very near the surface. The drainage system will lower this about four feet. About 4,000,000 feet of clay tile from 4 to 12 inches will be used.

The Vallejo Brick Works, which were started north of that town a few weeks ago, are prospering and increasing their force of workmen as rapidly as they can get them.

O. M. Wallace, J. J. Donough and Joe Dugan are planning to start a pressed brick works at Ely, Nevada, early next year. They intend to use the deposit of clay, of which there is a large body, six miles east of Ely.

The prospects that San Francisco will raise the amount of money to guarantee the finishing of the cantonment known as Camp Fremont, near Palo Alto, are excellent. This means the letting of a contract for $150,000 worth of sewer pipe for drainage purposes, and it is expected that this will be divided among the local concerns dealing in this product. The Terra Cotta Pipe has been active in raising the necessary money for this cantonment and has subscribed $5,000 to this end. Other subscribers who are well known in the trade are Lindgren & Co., $5,000, and John D. McGilvray, $2,500.

The Allied Union Brick Co. is putting in a new plant at Richmond. Special motor work is being put in in connection with oil burners, which will supply the heat for brick making. The motors range from two to forty-horse power and aggregate 125 horse power.

There has been some delay in the plans of the Pacific China Manufacturing Co., at Richmond, Cal., and it is understood that these plans will be materially changed before the business is established. What these changes will be have not been made public.

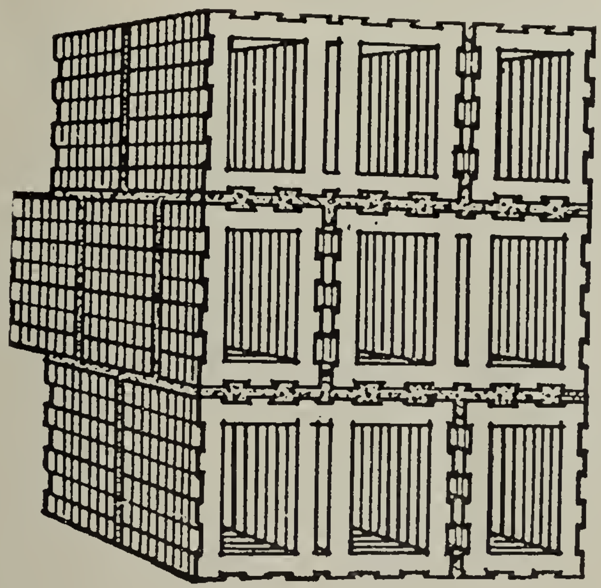
H. B. Potter, secretary of the Los Angeles Pressed Brick Co., Los Angeles, and C. E. Clough of Reno, Nevada, president of the Reno Pressed Brick Co., were recent visitors to San Francisco. They were here on business and each expressed himself as satisfied with the pressed brick situation in his community.
SUNSET.

San Francisco, December 4.

NEW HOLLOW TILE ON THE MARKET.

The Los Angeles Pressed Brick Company, which is always seeking to give their territory the newest and best in clay products, has secured the rights to manufacture the Health Unit Tile, a hollow clay building block so designed that the bearing webs rest directly over the webs of the blocks of the under course, forming an interlocking bond. The bearing wall constructed with these tile may be finished on the inside or outside by a plaster coat with furring, or may be faced with brick or terra cotta.

This hollow tile, manufactured at Tacoma from material available in the northwest, sustained in test a crushing strength of 55 tons per square foot and was guaranteed by the manufacturers to carry a safe load of 15,000 pounds per foot. With the better quality of material available in southern California it is expected these tests will be exceeded. The tile manufactured at Tacoma is said to have showed a weight of only 60 pounds per cubic foot, including motor, laid in the wall.



Health Unit Hollow Tile.

The advantages claimed for the new tile are that it makes the lightest wall and one that is the best bonded; that it is quick and easy to lay, requires the least mortar and is the most economical; that it can be used in any form of construction, meeting every condition; that it produces a wall equally strong in all its parts, including corners, and that it provides strength where it is needed to carry accumulative loads.

AMOUNT OF THE SECOND LIBERTY LOAN.

The amount of the Second Liberty Loan subscriptions which will be accepted is $3,808,766,150, which is the $3,000,000 offered and one-half of the oversubscription of approximately 54 per cent.

Secretary McAdoo states, in answer to inquiries, that the full amount of the subscription will not be accepted for the reason that the Government must not alter the basis upon which the issue of bonds was offered; that the banks and the public have adjusted themselves to the basis of the offering as originally made, and that it would be extremely unwise to alter that basis after the subscriptions have been received.

THE FOURTEENTH ANNUAL N. P. B. M. A. CONVENTION.

"The prompt and efficient delivery of food and supplies has become a military necessity. Our railroads and waterways are unable to meet this requirement. Our highways are the only avenues of transportation relief. Shall we make the most of them?"

THE FOURTEENTH ANNUAL MEETING of the National Paving Brick Manufacturers Association may aptly be termed a "One Hundred Per Cent. Convention," for when the roll was called, practically the entire membership answered "present," and there were quite a number of paving brick manufacturers in attendance who were not on the membership roster. The meetings were held in the assembly room of the Hollenden Hotel, Monday and Tuesday, November 19 and 20. The first session was devoted to the reports of officers, standing committees, etc. Ex-president Deckman submitted the following report of Committee on Officers' Reports:

Gentlemen of the Convention:

Your committee, to whom has been referred the reports of your officers, having considered them, begs leave to report as follows:

The President's Report.

His reference to the business of our industry as affected by the conditions prevailing at this time throughout the world is clear, sound and appropriately set forth, and it is of the greatest concern to our united industry that we bring to bear all our forces for the solution of the appalling trade conditions brought about by the world conflict, in which we are playing a prominent part.

Our industry needs the best efforts of its most able men unitedly to solve plans for our immediate and future existence, and this should come unselfishly and ungrudgingly from both the members of the National Paving Brick Manufacturers Association and the large number of manufacturers of paving brick without the fold, who are benefiting by our Association's efforts.

We commend his report on this phase of our industrial condition for most careful thought and consideration.

We also commend the several propositions as noted in his report.

First, the consideration of types of construction.

Second, promotion.

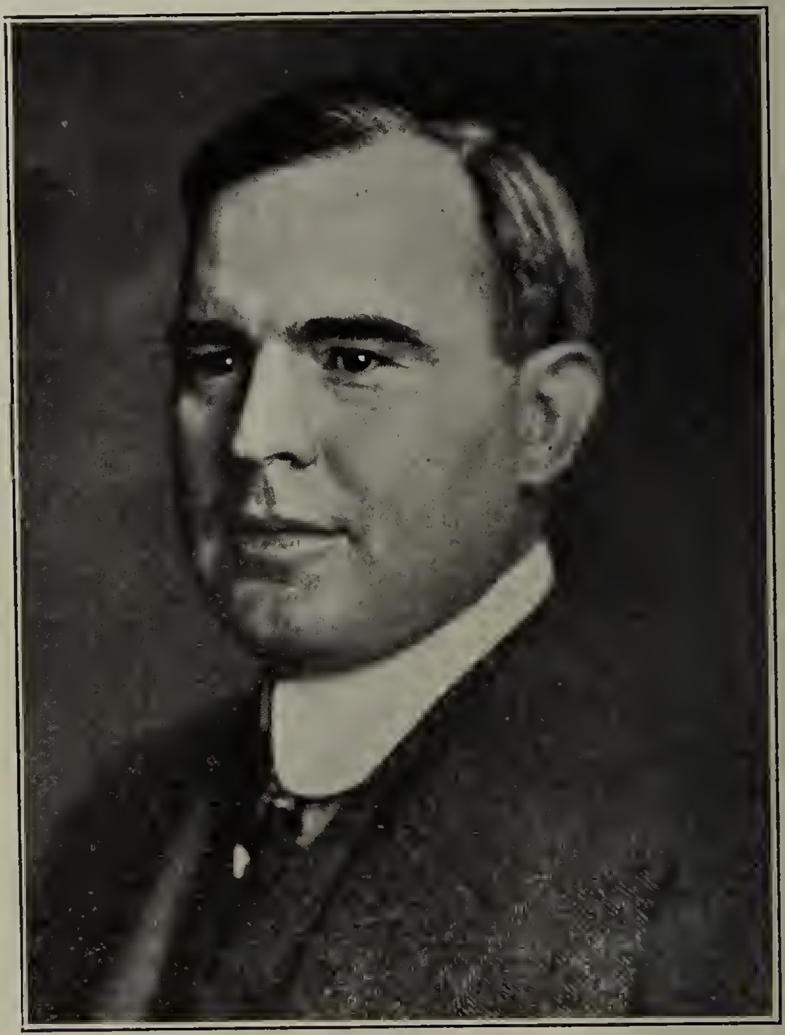
Third, contractors and contracting conditions.

Your president has dealt with each subject in a broad and most able manner, and we recommend that this Association approve of his suggestions as to the remedies, and formulate a plan by which the same may become effective in a most substantial way for the interests of the industry as a whole; and we especially and most heartily approve and applaud his brief sentence, "If every paving brick manufacturer would 'hit the sawdust trail' of the Association, we have perfect confidence that the industry will soon occupy the place to which it is entitled." And we recommend here and now that at the conclusion of this report each firm or corporation represented at this conference, not now members of the Association, be given the opportunity to join with us, or to give us their reasons for a failure to do so.

Report of Secretary Blair.

Your committee approves and commends this very able report as naming many of the difficulties involving our Association and the industry and his suggestions in remedy therefore. You will recognize the general trend of all these reports are very similar, but the viewpoint of the official dealing with the several problems gives us a broad vision of the important features affecting our industry and business.

We most sincerely feel that our Association owes to our Secretary a hearty approval of his alertness in safeguarding the interests of our industry in interposing Association action to stay the attempted efforts that were made to impose on our industry injurious burdens and inflict greater hardships on the testing of paving materials.



President, C. C. Blair.

It is indeed gratifying to your Committee to note the splendid efforts of the advertising program as carried out so successfully in the publication of Dependable Highways and the expansion of the work developed by this journal will successfully promote the cooperative interest and active influence of the several neighborhoods in which the twelve thousand numbers circulate each month.

His reasons for conditions effecting our industry should all receive most careful thought and consideration and action to provide means whereby the serious conditions may be overcome, should meet with a wholesouled and cooperative action by all the manufacturers of paving brick, regardless of their Association relation and we recommend the appointment of such committees as will attempt to solve these "first to fifth" problems.

We also recommend the appointment of a special committee to deal with the contractors' relation to our industry with a view of establishing some permanent basis to insure united and cooperative action for the most perfect and improved methods of construction and of mutual advantage to all interests involved in road and street improvements.

Other important subjects, such as transportation, obnoxious or obsolete laws, and many others demand our closest attention and meet with our approval.

The development of Governmental relationship should be cultivated to the utmost, that all of the conditions obtainable for the advancement of our industry should be our rights and this should embrace every feature effecting the welfare of our industry.

Report of Assistant Secretary Macdonald.

The splendid, able report of Assistant Secretary Macdonald is most gratifying, dealing as it does with the larger and broader field of advertising for which we have all had the fondest hopes without the pleasure of realization.

We cannot refrain from quoting his sentence, "There is nothing to prevent us at this meeting from deciding on some kind of plan and once we have agreed upon it let us carry it out to the letter." We all say fine and amen. But—and there's the rub—about 40% of our paving brick manufacturers have not yet seen the light of day, and your committee cannot but feel that until this "light" shall have fallen with "livid flame" upon them, Mack's "vision" will fail of realization, but we most highly commend his report and effort and success will some day be ours.

Report of Chief Engineer Greenough.

For the first time in the history of our Association we have this report. The subject of this report is most vital to our industry and while reference has been made to it in the reports of other officers, Mr. Greenough deals with the subject in a comprehensive and straight forward manner and we urge your most serious and careful consideration of the solution therein proposed to safeguard the future of a much abused subject and we recommend action be taken at this meeting with a view of strengthening our position and making possible our dream of the "ideal street pavement."

Report of Treasurer C. C. Barr.

The treasurer's detailed report shows a balance of $9,467.00 on hand November 2nd, and this amount is certified to by The Union National Bank of Streator, Illinois, as of that date, and while this is quite a healthy balance, there is much need for our every effort in conserving the funds as much as the welfare of the Association will permit, because of the impending possible resources for the ensuing year. We commend the completeness of the Treasurer's report and congratulate the Association on its good fortune in having so faithful and worthy custodian of our life—the funds.

Other matters referred to this Committee were the report of the auditor of the accounts and records of the officers of the Association during the past three years. This is most complete and we recommend the same be referred to the Office Committee for such action as deemed most advisable as to the recommendations therein contained.

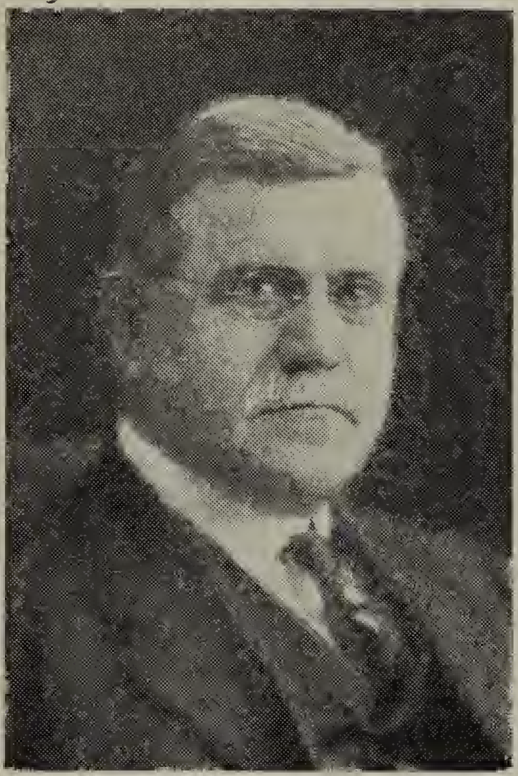
Also report of Committee on Technical Investigation, and as we do not feel that it is within the province of this Committee to make report on this subject, respectfully refer to the Association for such action as may seem most wise and reasonable.

Believing this report covers all the matters brought to our attention and of which we believe was within our province to make report on, we submit this, our best efforts of the Committee's duties.

Respectfully submitted,

CHAS. J. DECKMAN,
Chairman, Committee.

Treasurer C. C. Barr.


Secretary W. P. Blair.

Assistant-Secretary H. H. McDonald.

The Annual Dinner.

The social event of the meeting was the annual dinner for which an interesting program had been prepared. The program itself was an interesting souvenir as it bore formal announcements which proved the key to the discussions or toasts which followed the dinner service. On the front page was the following terse statement:

"Shall we who are able to supply the nation's need remain unconcerned in this hour when that need is most vital to sustain our country's industrial power and its military supremacy? The nation's transportation want is our opportunity to serve. Shall we be equal to the responsibility?"

Charles A. Otis, president of the Cleveland Chamber of Commerce served as toastmaster, and proved an adept in the art of introducing after dinner speakers, who proved staunch advocates of highway improvement. The speakers generally conceded that if we now had good brick paved roads on the main thoroughfares the congestion on the railroads would be relieved materially, for as the slogan on the menu stated, "If you can't get a railroad car, haul it over a brick paved road." This could be done with the heavy service auto trucks now in use IF we only had rough brick paved roads. It is apparent to students of the question that brick paved highways are essentials during war times, and it was resolved that the N. P. B. M. A., co-operate with the National Highway Transport Committee, for the purpose of encouraging the permanent improvement of all the main highway lines.

Election of Officers.

Vice-president J. W. Robb, declined a re-election as Vice-president, stating that while his heart was with the Association he was no longer directly engaged in the manufacture of paving brick.

Assistant Secretary H. H. Macdonald who has served the Association long and faithfully in that capacity, also declined re-election stating that he had accepted a position as Secretary of the Gypson Industries Association with headquarters in Chicago, to take effect December 15. His resignation was accepted and ex-president Deckman presented a resolution thanking Mr. Macdonald for his long and faithful service, and on behalf of the members of the Association presented him with a beautiful souvenir in the form of a diamond scarf pin.

The following officers were elected unanimously: President, C. C. Blair, Canton, Ohio; Vice-president, J. L. Murphy, Nelsonville, Ohio; Treasurer, C. C. Barr, Streator, Ill.; Secretary, Will P. Blair, Cleveland, Ohio.

Though not able to be present in person, Marion W. Blair, Thornton, W. Va., sent a most instructive paper on "The Relationship of the Present Labor and Fuel Cost to the Market." An interesting paper, "The Value of Paving Pitch as a Binder in the Construction of a Macadam Base for Brick Roads, and also As a Filler," was presented by Mr. J. S. Crandall, representing The Barrett Manufacturing Co., of New York City.

Membership Committee.

A Membership Committee was appointed, consisting of Harvey C. Adams, Danville, Ill.; Spencer M. Duty, Cleveland, Ohio; F. L. Manning, Portsmouth, Ohio; Eben Rodgers, Alton, Ill.; F. L. Stowell, Olean, N. Y., and Secretary Will P. Blair, as an ex-officio member.

The Association went on record with a strong endorsement of Mr. S. M. Williams of Lima, Ohio, for appointment on the Highway Transport Committee of the National Council of Defense.

Both during the business sessions and at the annual dinner, Priority Order No. 2 was criticized as in no way aiding in the prosecution of the war but rather it was held to be an immediate hindrance. The feeling against this Order was particularly directed towards that part of it which classifies road building along with the making of musical instruments as a non-essential commodity.

Resolutions Adapted.

The following important resolutions were passed, unanimously:

"Be It Resolved, That there be a committee appointed by the President of the Association, the membership thereof to include the President of the Association and its Secretary, and four other persons to be selected by the President, whose duty it shall be to represent the Association industry in matters affecting the industry, arising out of any governmental relationship."

"Be It Resolved, further, That in order to increase the effectiveness and influence of the Association in all matters affecting the welfare of the paving brick industry, that the Membership Committee be increased to five in number. The Secretary ex-officio to make the sixth member thereof, and that this committee be charged not only with actually securing memberships in the Association, but that they be and are hereby specially charged with seeking conferences with allied and local Associations for the better correlation of efforts, unity of action, and especially a finding out of reasons if any there be why any single manufacturer or group of manufacturers remain out of membership in the National Association. In connection with this duty the special purpose therefor is found in the great necessity for the amplification of funds for an effective advertising campaign."

The Committee on Government Relationship consists of: C. C. Blair, Canton, Ohio; W. P. Blair, Cleveland, Ohio; J. W. Sibley, Birmingham, Ala.; W. G. D. Orr, Galesburg, Ill.; A. L. Shulthis, Independence, Kansas; R. T. Hutchins, Wheeling, W. Va.

Reports regarding the continued improvement of streets and roads gathered from over one thousand cities and from various states in the Union, indicated a preponderance for the prosecution of such work exceeding seventy-five per cent. The progress with which such work is proceeding, according to reports shows an average of less than seventy-five per cent. compared with one hundred per cent. normal.

From every source it was conceded with but slight exception, that street and road work at this time was of the utmost importance. The attendance at the meeting represented about twenty states of the Union.

The reports indicating the measure of public sentiment with reference to street and road improvement, naturally led to a discussion of market conditions which embraced all angles of the subject, transportation, labor, fuel, on the one hand and the great demand and insistence for improved highways over which may be moved the freight of the country which the railroads are unable to care for.

A multiplicity of instances were cited where truck movement over highways enabled industrial establishments to run independent of railroad service. After two day's consideration of market conditions, transportation difficulties and the government's necessity for winning the war in the movement of food and supplies, a unanimous conclusion was reached that road improvement was a war necessity and that it must be continued with all possible energy.

THOSE IN ATTENDANCE

D. R. POTTER, Thornton Fire Brick Co........Clarksburg, W. Va.
J. B. WILCOX, Alliance Clay Prod. Co..............Alliance, Ohio
JOHN EVER, Alliance Clay Prod. Co.................Alliance, Ohio
E. G. ZORN, Brick and Clay Record..................Chicago, Ill.
WALTER McKEEN, Burton-Townsend Co........Zanesville, Ohio
R. L. LEWIS, Athens Brick Co.......................Athens, Ohio
F. L. MANNING, Peebles Paving Brick Co.......Portsmouth, Ohio
C. C. BARR, Barr Clay Co............................Streator, Ill.
R. G. MILLER, Asbestos Protected Metal Co.........Pittsburgh, Pa.
M. B. GREENOUGH, N. P. B. M. A................Cleveland, Ohio
EB. RODGERS, Alton Brick Co.........................Alton, Ill.
B. F. THOMAS, Sterling Brick Co....................Olean, N. Y.
C. W. DENNISTON, Sterling Brick Co............Rochester, N. Y.
C. J. DECKMAN, Medal Paving Brick Co.........Cleveland, Ohio
F. L. STOWELL, Sterling Brick Co..................Olean, N. Y.
J. L. MURPHY, Hocking Valley Brick Co........Nelsonville, Ohio.
R. T. HUTCHINS, Mack Mfg. Co...............Wheeling, W. Va.

W. P. WHITNEY, Springfield Paving Brick Co....Springfield, Ill.
SPENCER M. DUTY, Medal Paving Brick Co.....Cleveland, Ohio
JAMES R. MARKER, Ohio Paving Brick Mfrs. Assn., Columbus, O.
CHAS. T. HARRIS, 356 Leader-News Bldg..........Cleveland, O.
H. H. MACDONALD, N. P. B. M. A...............Cleveland, O.
JAS. C. TRAVILLA, Dunn Wire-Cut Lub Brick Co., Conneaut, O.
HARVEY C. ADAMS, Danville Brick Co............Danville, Ill.
THOS. J. HAWKINS, Danville Brick Co............Danville, Ill.
WALKER W. WINSLOW, Indiana Pav. Brick & Block Co.....
....Brazil, Ind.
W. H. STONE, Manufacturers Record..............Baltimore, Md.
JOHN GLASS, Manufacturers Record...............Baltimore, Md.
F. VERNON ALER, Municipal Shale Brick Co...............
............................Martinsburg, W. Va.
W. H. LUCHTENBERG, Lake Shore Shale Brick Co........
....Ashtabula, O.
F. LAWSON MOORES, Harris Brick Co...........Cincinnati, O.
R. L. RUCKER, Medora Shale Brick Co...........Medora, Ind.
E. I. POSTON ....Martinsville, Ind.
F. T. TOWNSEND, Dunn Wire-Cut Lug Brick Co.....Conneaut, O.
R. C. BURTON, Burton-Townsend Co...............Zanesville, O.
C. P. MAYER, C. P. Mayer Brick Co............Bridgeville, Pa.
M. V. TRAUTMAN, Medora Shale Brick Co..........Medora, Ind.
JAS. R. THOMAS, Standard Brick Co.........Crawfordsville, Ind.
J. W. ROBB, Clinton Paving Brick Co................Clinton, Ind.
H. C. MOATZ, Medal Paving Brick Co............Cleveland, O.
W. R. BARNHART, Medal Paving Brick Co.........Cleveland, O.
JOHN W. SIBLEY, Southern Paving Brick Mfrs. Assn.....
.............................Birmingham, Ala.
W. T. BLACKBURN, Dunn Wire-Cut Lug Brick Co.....Paris, Ill.
JAMES M. WAUGH, Poston Paving Brick Co..Crawfordsville, Ind.
A. R. ROOT, Chambers Brothers Co............Philadelphia, Pa.
THEO. RANDALL, Clay-Worker................Indianapolis, Ind.
W. H. PARKS, Nelsonville Brick Co.............Nelsonville, Ind.
W. C. PERKINS, Dunn Wire-Cut Lug Brick Co.....Conneaut, O.
JAMES G. BARBOUR, Metropolitan Paving Brick Co...Canton, O.
WILL P. BLAIR, N. P. B. M. A...................Cleveland, O.
F. W. LUCKE, F. W. Lucke & Co.....................Chicago, Ill.
F. L. STEINHOFF, Brick & Clay Record...........Chicago, Ill.
C. C. BLAIR, Metropolitan Paving Brick Co..........Canton, O.
CHAS. G. DECKMAN, Medal Paving Brick Co......Cleveland, O.
S. W. HUME, Municipal Journal.................New York City.
STANLEY D. KNIGHT, Ohio Quarries Co..........Cleveland, O.
H. S. MALONE, Ohio Quarries Co....................Cleveland, O.
B. J. GALLAGHER, Veedersburg Paver Co......Veedersburg, Ind.
J. B. FISHER, Jamestown Shale Pav. Bk. Co....Jamestown, N. Y.
L. C. HERRICK...Norwalk, O.
L. A. AMSDEN......................................Ashtabula, O.
H. A. HUTCHINS..Lorain, O.
W. A. MEDDICK, Lakewood Engineering Co..........Cleveland, O.
F. G. MATTESON, Purington Paving Blk. Co......Galesburg, Ill.
A. L. HENDERSHOT, Cleveland Brick & Clay Co.....Cleveland, O.
J. L. HIGLEY, Cleveland Brick & Clay Co..........Cleveland, O.
HERBERT BUCKMAN, Cleveland Auto Club.........Cleveland, O.
R. L. BECK ....Cleveland, O.
YORKE H. SMITH ....Cleveland, O.
J. P. NEWMAN, Engineering Record.............Cleveland, O.
DEWEY LUCHTENBURG, Lake Shore Brick Co.....Ashtabula, O.
S. A. STANFORD, Barrett Mfg. Co...................Cleveland, O.
D. T. PERRY, Barret Mfg. Co.........................Cleveland, O.
M. J. BEISTLE, Barrett Mfg. Co......................Cleveland, O.
W. H. BUEHLER, Barrett Mfg. Co......................Chicago, Ill.
J. S. CRANDALL, Barrett Mfg. Co..................New York City
G. S. BLACK, Cleveland Engr. Society..............Cleveland, O.
L. HAUGH, American Clay Mch. Co.....................Bucyrus, O.
J. H. HERRON, Cleveland Engr. Society...........Cleveland, O.
C. U. HENDERSHOT, Cleveland Brick & Clay Co....Cleveland, O.
R. C. Jackson, Buffalo Brick Co................Kansas City, Mo.
G. W. THURSTON, Western Pav. Brk. Mfrs. Assn..........
...................................Kansas City, Mo.
A. C. EATON, Thurber Brick Co.....................Thurber, Tex.
F. A. CHURCHILL, Dunn Wire-Cut Lug Bk. Co....Conneaut, O.
D. H. NICHOLS, Allied Pub. Bureau................Cleveland, O.
E. J. MCINTYRE, Contract-Record......................Chicago, Ill.
O. W. RENKERT, Metropolitan Pav. Bk. Co..........Canton, O.
G. E. MOSHER, Coffeyville Vit. Bk. Co..........Coffeyville, Kas.
CHAS. FRANCIS, Francis Vitric Brick Co........Muskogee, Okla.
E. L. HESS, E. M. Freese & Co...........................Galion, O.
E. W. DOW, E. M. Freese & Co.....................Pittsburg, Pa.
R. N. CASE, County Surveyor.......................Ashtabula, O.
F. B. DUNN, Dunn Wire-Cut-Lug Brick Co........Conneaut, O.
D. W. JASPER, The Bonnot Co..........................Canton, O.
W. H. HILL, Murphysboro Pav. Brick Co........Murphysboro, Ill.
H. S. RENKERT, Metropolitan Paving Brick Co......Canton, O.
E. L. MIDDLETON, Barr Clay Co......................Streator, Ill.
G. O. FRENCH, Lincoln Paving Block Co............Canton, O.
ROBT. HOFFMAN, City Engineer.....................Cleveland, O.
F. R. WILLIAMS, Paving Engineer.................Cleveland, O.
F. A. BOWMAN, Cleveland Stone Co...............Cleveland, O.
A. W. CURTIS, Cleveland Stone Co..................Cleveland, O.
B. A. INGLIS, Copeland-Inglis Shale Brick Co....Birmingham, Ala.
R. W. TOUZEAU, Lakewood Engineering Co........Cleveland, O.
GEO. J. SENN, Cleveland Stone Co..................Cleveland, O.
J. R. MILLER, Cleveland Stone Co....................Cleveland, O.
T. A. GIBERSON, Cleveland Stone Co.................Cleveland, O.
CHAS. W. CLARK, Cleveland Railway Co............Cleveland, O.
MAYO FESLER, Civic League ....Cleveland, O.
H. F. CUMMINGS, Civic League, Engr...............Painesville, O.
ROBT. NESCH, Pittsburg Pav. Brick Co...........Pittsburg, Kan.
D. MOOMAW, County Road Engineer.................Cleveland, O.
S. WARD, Case School A. S............................Cleveland, O.
D. C. MATHEWS, Western Reserve...................Cleveland, O.
FRED H. CALEY, Cleveland Auto Club...............Cleveland, O.
P. B. KEPLINGER, Metropolitan Pav. Brick Co........Canton, O.
J. C. KLINE, Kline Brick Co...........................Wickliffe, O.

THE SHORT COURSE IN CERAMIC ENGINEERING AT THE UNIVERSITY OF ILLINOIS.

THE University of Illinois Short Course in Ceramic Engineering will be given January 7-19, 1918. The Course will be under the direction of Professor E. W. Washburn, Head of the Department of Ceramic Engineering, and Prof. A. V. Bleininger, Ceramic Chemist of the National Bureau of Standards, assisted by Professors C. W. Parmelee and R. K. Hursh, of Illinois, and a corps of lecturers on special topics. The two-weeks' Course is intended to cover in an elementary and practical manner the scientific principles underlying the practice of clayworking. A common school education will suffice for the work of the course and no tuition fee will be charged. The course is open to all who are interested. The following subjects will be treated by means of lectures, conferences and laboratory work:

The Physics and Chemistry of Ceramic Materials and Processes, 15 lectures; Ceramics and the War, 1 lecture: by E. W. Washburn, Professor of Ceramic Chemistry.

The Origin and Classification of Clays, 2 lectures; Prospecting and Sampling, 1 lecture; The Shaping of Clays, 2 lectures; The Testing of Clays, 5 lectures and 8 laboratory periods by C. W. Parmelee, Professor of Ceramic Engineering.

The Winning of Clays, 2 lectures; The Use and Conservation of Fuels in the Burning of Clay-wares, 2 lectures; The Handling and Transportation of Materials, 1 lecture; Dies, 1 lecture; by R. K. Hursh, Assistant Professor of Ceramic Engineering.

Engines and Boilers, 3 lectures; by A. P. Kratz, Research Associate in Mechanical Engineering.

Explosives and Blasting, 1 lecture; by E. A. Holbrook, Superintendent of the Urbana Station of the United States Bureau of Mines.

Steam Shovel Methods, 1 lecture; by H. H. Stock, professor of Mining Engineering.

Boiler Waters, 1 lecture; by W. F. Montfort, Acting Professor of Sanitary Chemistry.

Kilns and Kiln Construction, 3 lectures; The Principles of Drying, 3 lectures; by C. B. Harrop, Assistant Professor of Ceramic Engineering, Ohio State University.

The Composition and Properties of Coal, 1 lecture; by S. W. Parr, Professor of Applied Chemistry.

Gas Producers, 2 lectures; by Dean C. R. Richards.

Burning, 3 lectures; Refractories, 3 lectures; by A. V. Bleininger.

Dynamos and Motors, 2 lectures; by I. W. Fisk, Assistant Professor of Electrical Engineering.

The Legal Rights and Obligations of Employer and Employe, 2 lectures; by C. E. Carpenter, Assistant Professor of Law.

The Scientific Selection, Management and Utilization of Labor, 3 lectures; The Purchase and Conservation of Materials and Supplies, 1 lecture; by Mr. Dwight T. Farnham, Industrial Engineer.

Lubricants and Lubrication, 2 lectures; by................

The Location, Control and Care of Machinery, 2 lectures; by G. H. Radebaugh, Acting Director of Shop Laboratories.

Elective courses (1) in drafting; (2) in chemical laboratory work, and; (3) in bodies and glazes, will also be offered.

A bulletin describing in detail the courses and methods of instruction has been issued by the university, and this will be sent free to all who request it.

REPORT OF SIXTH ANNUAL MEETING OF THE AMERICAN FACE BRICK ASSOCIATION

THOSE WHO ATTENDED the recent convention of the American Face Brick Association at French Lick, Indiana, need not be told that train service is not what it ought to be. So many of the delegates, especially those from the East were delayed en transit from six to twenty-four hours that it was found necessary to postpone the first sessions scheduled for Wednesday, December 12, until the forenoon of Thursday. The hard luck stories of missed connections, and lay-overs en route to the convention if compiled in book form would make a very large volume. But ultimately nearly one hundred of the faithful arrived and registered, and, notwithstanding the unheard of winter weather, they were made so happy by the fine service and cozy surroundings in Mr. T. Taggart's hotel that they soon forgot their troubles and hardships encountered on the way, and proceeded to enjoy the greetings and conferences of the good fellows who make up the Association's membership.

The first session was called to order at ten a. m. Thursday. There was the usual roll call and the reading of the minutes of the previous meeting which were duly approved. Then followed President Bass's address which was a forceful and interesting presentation of the status of the Association, present and prospective.

PRESIDENT'S ADDRESS.

Geo. A. Bass, St. Louis.

Gentlemen of the Convention:

The chief executive and legislative functions of this Association have for their aim the cultivation of a sense of mutual confidence and loyal co-operation among its members.

The practical working power of the Association lies in its Board of Directors, and the board, in addition to its executive and judicial duties should develop and formulate the policy of the Association for consideration at its annual meetings.

A year ago we adopted the principles of the "Open Price" policy, and your directors have chiefly been busy the past months in endeavoring to develop our first plan—intended to improve, so far as possible, our market conditions.

As you know, there was nothing involved other than the publication of wholesale prices. The plan has been successfully carried out and although it has undoubtedly raised the general level of our business, it has only partly eliminated the evil of price cutting.

Your quotation binders disclose all prices of all grades at all plants, but as yet we have made little progress in covering the retail markets. The ultimate selling policies are still largely controlled by others; our customers too frequently are non-consumers.

The service of the middleman is proper and essential, but it is not as yet sufficiently co-operative, and until we show greater interest in the ultimate selling price, there will never be price stability.

I do not wish to make undue criticism of the dealer—we are partly responsible—but, granted he has seemingly out-traded us, he needs stabilizing as much as we do. Whether they can agree on a uniform service charge or not, there should prevail an assurance that the service charge is both real and sufficient, and not simply a helpful contribution to a possible cement or drayage contract.

The New York dealer can have little in common with dealers in distant cities, but they are all equally and vitally interested with the manufacturers tributary to their various centers. This alone explains their presence in our meetings. If we can devise some methods of eliminating this trading feature between manufacturer and dealer, so that our interests become not mutual but identical, I then personally see no reason why both memberships should not be comprised in one association. As it is, welcome though they be, there should be some better footing for their attendance. We should encourage open price dealers' associations.

Our most effective practical work has been done in our various division meetings. They are rapidly becoming genuinely constructive, and the Association itself must bestir itself or lose their respect.

I have attended a number of these meetings myself, and to me, they have been most illuminating. Members first came with evidences of considerable curiosity and much suspicion, but they soon began to ask for more than we had to give.

There have been many exchanges on matters of common transportation questions, and better forms have been devised for safer sale and collection practices.

Bricks have been standardized in size and grades, and new and better methods of distribution in territory without large centers have been developed.

Almost universally there is a published factory price, and a distant one, by the simple addition of the freight and distribution service charge. The day is coming when we will the more intensively develop and exploit the markets in our immediate natural fields of operation, and look less longingly on the job in the town of our neighboring manufacturer.

From the divisions have come the suggestions that we maintain a general credit bureau, and plan to develop a service department with technical facilities for compiling relative competitive building costs, to determine that brick construction costs are not prohibitive.

From the divisions comes the plan for the promotion propaganda which is before you, and I trust it will have your earnest, favorable consideration.

Interest and suggestions have come in proportion as service has been rendered. Great credit is due the chairmen and secretaries of the different divisions for their conscientious and exacting service during this formative period.

In all this we have striven to avoid even the appearance of questionable agreements or understandings, but there is a growing respect for the man that makes a good product and is able to get a good and sufficient price for it. We have been criticised for ultra-conservatism and timidity on this question of scrupulously observing the anti-trust laws. A number of us, however, have paid substantial fees for opinions on these matters, and feel disposed to be guided by them.

In some quarters, too, there is criticism of the work accomplished by the Association. Much is expected and relatively little contributed by those criticising. A useful association is always slow of development. Much patience must be exercised and a spirit of forbearance shown those found in occasional error and who are slow to develop the association point of view.

We are makers of products, for the most part, that are non-essential for the war, and both patriotism and self-interest should suggest radical curtailment in production. Whether the use of labor and materials is made impossible by regulation or not, our industry, I think, can be relied upon to bring itself into adjustment with the war needs of the country.

We belong to the largest single industry in the country—a potential power of great influence—and yet there is no single association including all the varied lines involved in building construction.

All moves in Washington are usually preceded by published suggestions from the Chamber of Commerce or others, as to the probable necessity for government regulation under certain conditions due to the war.

There is a rumored suggestion that we are not in the preferred list, but whether we finally have utter stagnation in building or not should depend on positive necessity. If possible, we all wish to retain some portion of our manufacturing organization as a nucleus for future operations (and incidentally enable us to pay needed taxes and subscriptions to the many and varied worthy war causes), and we should be allowed some portion of our requirements for labor and materials so long as possible.

But if the Government actually needs our coal and our men, the non-essential brick plants should certainly close.

The building industry might well be represented in Washington, not for the purpose of selfishly influencing Government action, but that we may have direct information as to what the actual and real necessities may be. The Government is not predisposed against the building business, nor have we reason to question its motive, but it is apt to do that which will yield sure results with the greatest ease.

We might well be better organized for purposes of conference and co-operation, that we may be assured our industry is not unnecessarily discriminated against. We should probably not take the initiative to bring the various lines in the industry together, but should certainly join any such movement.

Generally, our business has suffered and been adversely affected by all the rapidly changing conditions since early spring. We have contended with strikes, labor shortage, curtailed production, and all the hazards accompanying uncertain, insufficient transportation service, and have seen all costs in all departments, increase tremendously.

That we have so far survived and are here is, I believe, due to the beneficial, helpful influence of the Association. It involves your one best possible chance to survive this frightfully chaotic time.

It is necessary, however, that your officers have the co-operative help of all. A few have given needed service most freely, and the many have been content that they should. What we need is active, universal, association service.

For almost five years building construction has been below normal. The surveys made of housing conditions in most localities show great need for new construction, and while we are adversely suffering now, few industries give such great promise of growth and prosperity when the world again returns to peaceful pursuits.

Enlist for service then, and do your utmost to co-operate with your fellow manufacturers and allied agents and dealers, in whatever division you may be, that there may be no just criticism of your attitude anywhere. What is good for one is good for all. Seek not to eliminate anybody, but strive to win confidence, to the end that competition may not involve either price cutting or unfair methods, as fair dealing, involving the chivalrous spirit of "give and take" will, with certainty, add much, both to your pleasure and profit. (Loud applause.)

The next number on the program, "General and Financial Reports" by Secretary-Treasurer Hollowell, afford an ample proof of a busy year in the executive office of the Association during which many kinks and wrinkles incident to getting the organization machinery in good working shape have been smoothed out and the way paved for more efficient and effective work in the future.

The reports of committees being next in order, the following was submitted by H. E. Stringer, Secretary of The War Service Committee.

WAR SERVICE COMMITTEE.

Gentlemen of the Convention:

What is the object of any War Service Committee, and particularly of such a committee in our organization?

The great object must be to assist in the winning of this war, the secondary object being the assistance of the Association members. In this connection is it possible for our committee to assist the government in winning the war, and subsequently to assist the membership?

Organized shortly after the declaration of war, our committee has endeavored to carry on its proper work to the best of our ability. We must unfortunately admit that to a great extent we have failed of our objectives. No report could adquately cover efforts which have been made, and as our successes have been limited, it is not necessary to go to any great length along that line.

We did succeed in assisting our paving brick friends in changing the general roadway specifications for the cantonments, and we have also succeeded in assisting them in securing orders for paving in some cantonments. Our efforts as regards face brick were generally not so successful. We made strenuous efforts to get the officials in the Quartermaster's Department in charge of the emergency construction work to permit the use of brick for some of the cantonments, instead of frame construction, using various pleas such as approximately equal cost and time required to build, less fire risk and greater comfort to occupants, etc. This matter was covered with a number of higher officials in person and in formal written communications as applied to the general proposition, as also applied to specific cantonment groups and lastly with the Council of National Defense in reference to the two million dollar temporary building on the old Pennsylvania Railroad site at Washington. In none of these cases, however, did the Government officials see our contentions altogether, although in the case of the Washington building referred to, officials did admit the correctness of our contentions in reference to the fire risk, heating and comfort of occupants.

Recently we have had up with the Priority Board the question of the elimination in transportation of so-called non-essentials and thus far our efforts combined with the efforts of other manufacturers and shippers has resulted in a refusal on the part of Judge Lovett to issue the priority order sought by various railroad presidents. Within the past several weeks we have had up with minor parties connected with the Government the question of general transportation situation, this matter now being given great consideration by various Government officials in view of the present unsatisfactory transportation conditions. Our ideas have been requested in this connection, but as yet nothing definite has developed, and, of course, we are now waiting to learn the President's ideas in response to the suggestions of the Interstate Commerce Commission to Congress regarding the railroad situation.

As you will well appreciate, we are of necessity reporting only in generalities. We have not referred to the hundreds of letters which have been written to various parties. We have not referred to the hours spent waiting to see some army officer, only to find so frequently that said party had no authority and referred us to some other officer located in some other section of Washington. We have not referred to the arguments with some of the officials in the Quartermaster's Department in reference to the relative merits of frame construction as compared with brick construction nor have we referred to the many conversations with junior officers of minor clerks in an endeavor to build up the inside demand for further consideration of this important subject. Nor have we reported tthe many conferences with railroad officials wherein we sought to get the carriers' side of the transportation difficulties and to acquaint them with our problems.

Now, what of the future? Our efforts in the past have not been altogether successful, nor have they been satisfactory in the main to your committee. We have, however, started our work in fairly good shape, and you will well appreciate that it is no easy matter to properly start an extensive work of this kind. The Government itself was swamped by the war conditions, and your committee was at first somewhat in the same position when presented with this work. We now, however, understand matters better and are better organized to handle same, and feel sure that in the future there will be less lost motion than in the past. Your committee is firmly convinced that your War Service Committee constitutes possibly the most important committee in our organization at this time. So long as our Nation is at war, the Government's one consideration will be the winning of the war. This means that our Government will dictate, either directly or indirectly, to what extent the face brick business shall go on. Priority orders may be issued by Judge Lovett affecting the transportation of our material. Dr. Garfield, the Fuel Administrator, will issue drastic restrictions regarding the use of fuel by us. General Littell's office in charge of construction work will direct or indicate materials to be used in said work, and so it goes. We are and will be absolutely beholden to the Government and it is therefore absolutely necessary that we have a strong war service committee able and ready at all times to present our interest to the various officials. To the extent that our interests do not conflict with the success of the war, we are entitled to some protection and we cannot secure protection individually but only through the efforts of a committee representing our entire industry.

General building construction will probably be limited until the war is over, and if our business is to continue to any extent at all, we must seek a considerable portion of the Governmental construction. Already some of us have secured a few so-called war orders for permanent construction, but the amount of same has been small. The Government is now considering the building of sixteen additional cantonments, and that matter will be presented to Congress at the present session. Further, a large amount of permanent buildings will be constructed, in fact, some of same are already under way. Surely we will not be alive to our great possibilities if we do not compete vigorously against the lumber and cement interests on all of this work. Now it is not to be assumed that your War Service Committee can assist any of us on individual business, but your committee can assist the entire membership in handling the basic matter of material with the Departments at large, and with individual Quartermasters in detail. As you are already aware the subject of transportation is giving the Government and the railroad managers grave concern, and it is certainly giving us the gravest possible concern. Only through the strongest efforts of our War Service Committee can we obtain any vestige of our rights. Probably the most pressing question of the moment is the Government's attitude toward the railroads. Will the President appoint a railroad dictator; will he favor Governmental control; or will he favor continuing the control in the hands of the present railroad executives with modifications of existing laws which forbid some of the present emergency practices of the railroads? The adoption of any of these plans will necessitate the most thorough consideration of the problem by our membership, and the War Service Committee must of necessity watch developments carefully and promptly protect our interests. It frequently happens in matters of this kind that speed is an essential requirement and a small committee can, therefore, accomplish results which would not be possible if we were compelled to wait for action by the entire organization, either individually or collectively. We are probably not united on the question of Governmental ownership but we are united in the protection of the fundamental interests of our industry. As yet, our Committee has not touched the matter of fuel for our industry, but we are positive that at a very early date this matter can be taken up vigorously with the fuel administrator, that is, not the question of fuel for individual brick plants but the broader question of fuel for the entire industry.

Another field which requires attention is in reference to cost of our material as compared with others. This is being considered in connection with the proposed promotion plan, but we will need something along this line very shortly, possibly in the next large building operation. We should secure the assistance of several large general contractors, and through them present figures showing the costs with different materials. This particular field cannot be handled by the membership individually because of the liability of incurring displeasure of specific contractors. It can be handled thoroughly by the Committee.

In conclusion your Committee respectfully repeats that while we have worked hard in starting this proposition, we are not satisfied that we have secured anywhere near the maximum of results, but we do feel that the future work of this War Service Committee will be of vital importance to us all, and we earnestly seek the strongest possible support of the entire membership.

Speaking in a most patriotic vein we are not convinced that because certain parties are in charge of certain details connected with the war they are endowed with supernatural ability. We are all aware that construction work is a very important part of our war preparations and surely this membership possesses knowledge and information of vast importance to the Government. Your War Service Committee is the means for presenting the facts properly, and offers probably the best method of assisting our industry in these trying days and contributing to some extent, even if slight, to our Country's success in the war.

Respectfully submitted,
WAR SERVICE COMMITTEE
H. E. STRINGER,
Member.

The first formal number on the program was an address by A. C. Ernst of Ernst & Ernst, expert accountants. Mr. Ernst spoke extemporaneously and without notes, touching at considerable length on the many complications and puzzling phases of accounting now required by the various government departments and particularly the revenue department's requirement in connection with the Income and Excess Profits Taxes. He had with him quite an assortment of documents, rulings, official opinions and explanations from which he quoted freely, and from which he showed the great confusion that exists at the present time about matters of this kind. He pointed out that some of the government departments insist upon one method of accounting and balance striking, while another may have entirely different ideas as to certain phases of the compilation of figures and so it goes. His final recommendation after explaining to the best of his ability quite a number of complicated points and rulings, was that in making the annual appraisal and inventory the brick manufacturers strive to be conservative and as nearly uniform as practical, and to especially guard against going to extremes one way or the other. That is of one striving to see how low an appraisal he can get while another may try to see how high he can get his appraisal. Careful attention to details and conservative appraisement of plants and properties at the annual inventory was the gist of his final advice.

The Need of Greater Publicity.

It was fitting that G. C. Mars, the publicity man for the Hydraulic-Press Brick Co., should prove to be the genius of the gathering in his handling of the subject of how to develop and create a newer and wider market for brick, because he has had a wide experience of this kind and the Hydraulic Company has done more to advance and promote interest in brick and brick construction by effective advertising than any other one concern in the world.

One listening to the address was of two minds, which to admire most, the thorough and thoughtfully prepared paper which Dr. Mars had gotten up, or the manner of its delivery which was most interesting.

His paper proved to be a master plea for the use of printer's ink, because of its appeal to the mind, its conveying of instructions and arousing of enthusiasm in the subject.

He declared at the outset that it is only by printer's ink that we can blazon the merits of our wares on every white space in sight and address every man that can read and buy. He said that extended impersonal salesmanship such as is accomplished by advertising is a method of extending the market for manufactured products which has become widely accepted in the modern business world and is so obviously necessary for producing quantity and sales that argument in its favor would seem to be superfluous.

Then after going to considerable length into the subject of what had been accomplished in many other lines by the use of the printed page and poster advertising, he told of the small showing which had been made by the brick industry along this line, citing several examples of comparison in which brick was so obscured and overshadowed by other building materials and other forms of advertising as to seem ridiculously insignificant, yet brick is the greatest building material on earth. Moreover, as he pointed out, the building industry is one of the great industries of the country, not only involving much capital but also the welfare of many people including artisans in various branches of the skilled trades as well as manufacturers of material. He told a story of a prize contest in the House Beautiful in which the prize house was of frame construction, largely because all other kinds of building material but brick had been freely advertised, so the architects naturally thought it was a wooden house that was wanted.

He told of the propaganda of the cement people and how it awoke the lumber people who are now occupying the field, have dug in and are guarding their trenches, and that so far he didn't think the face brick people have waked up, but they were beginning to yawn and rub their eyes. Then he told this one:

"The Literary Digest, one of the best national mediums, has recently made a very complete and illuminating report on the advertising of building materials and equipment during the first six months of 1917. It is worth our while to consider it. Under sixteen different heads, such as cement, plumbing equipment, expanded metal, lumber and trim, marble and stone, the Digest has carried the advertisements of 90 different concerns during the period in question, covering 151 pages of white space. Among all of these appeared one face brick manufacturer, occupying two and a half pages—all honor to the lonely and intrepid advertiser! Turn 148 arc lights on an object and see how much attention you would get by holding up your piddling 2½ lamps. Moreover, the Digest has summarized material advertising in 23 other national publications, claiming an audited subscription list of 10,000,000, which means at least 20,000,000 readers. The number of concerns advertising runs all the way from 16 to 62 and the space occupied amounts to over one thousand pages. Here again face brick appeared in one of these publications and occupied four pages. The light showing on brick is growing even dimmer.

"Does this seem fair to face brick which is far and away better in many respects than either cement or lumber? And does it indicate that you are pursuing the best method of reaching the largest possible number of purchasers? Does it show that you are going out into the great market of the world and seriously trying to sell your product? The questions answer themselves and explain in a large measure why you are selling only $10,000,000 worth of face brick annually instead of $30,000,000. I do not wish to offend you, gentlemen, but I am forced to say that you are asleep, and people don't know that you are at home."

Many other good points were made, too many to be embodied in detail in the present report, and then in the final summing up he said:

"If you do finally make up your mind, as an Association, to co-operate loyally and in good faith for the national promotion of your product through judicious advertising, I am very sure that it will not only strongly tend to diminish narrow localisms, lessen distrust, jealousy, and suspicion, and create a broader spirit of mutual confidence and fellowship among you; but also abundantly bring to you the advantages, proved by the experiences of others, which I named at the beginning.

"It will react upon you beneficially by giving you higher ideals of accomplishment and a sense of pride and determination in making good. It will open to you, and compel you to meet, the demands of the whole wide range of possible purchasers—even the universal Henry Ford market which as yet, you have scarcely touched. It will favorably introduce your product and your salesmen to every prospect in the country; and it will increase your working resources by an immense invested capital of good-will which is worth the money at any price. To say nothing of the public good will which is in itself of incalculable value, it will create what you most highly price, the good-will of the whole architectural profession. For these trained and skilful men will not only recognize that you are furthering their interests by promoting building in general, but also fully appreciate, what ought to make you justly proud of your industry, that you are co-operating with them in advancing, throughout our broad land, a more substantial, a more durable, a more worthy, and a more beautiful architecture."

J. M. Adams of the Committee on Uniform Accounting made a brief oral report for this committee, stating that the happenings of the present year have shown the wisdom of the plans outlined some time ago for getting uniformity in cost accounting, because uniformity and thoroughness is going to be needed in making out the many reports that will be required by the different government departments during the coming year. He said they had been delayed some in getting their blank forms because of war conditions, but they had the forms outlined and would get them distributed to the trade through the Secretary's office as soon as practical.

The Executive Committee prepared resolutions pertaining to standards and terminology for the face brick industry which was read by the Secretary, and after being discussed and slightly amended in some details was adopted, the resolution being as follows:

RESOLUTIONS ADOPTED.

Whereas, Much confusion and trouble has long existed because of the different standards of size and terminology used in the face brick business of the country, and

Whereas, There is now a demand on the part of the architect, contractor and the brick manufacturer for the adoption of definite standards of size and terminology, now, therefore, be it

Resolved, That The American Face Brick Association, representing approximately sixty-five per cent. of the entire production of face brick of the United States, being assembled in its annual convention at French Lick Springs, Indiana, December 12, 1917, hereby adopts the following standards and respectfully recommends them to all manufacturers and users of face brick.

Resolved, That the secretary of this Association be instructed to give the widest publicity to the action herein contained, to the end that the architectural profession, the building trades and the brickmaking industry may be fully advised on the subject.

STANDARD SIZE.

(A) The "standard" size of face brick shall be approximately as follows: 8 in. by 2¼ in. by 3¾ in.

(B) In referring to the size of a face brick it is desirable that the three dimensions be stated in some definite order for the sake of clarity and uniformity. As the length and thickness of the brick are the dimensions most often appearing on the face of the finished wall, the length shall be stated first, the thickness second and the width last, thus, 8 in. x 2¼ in. x 3¾ in.

(C) This "standard" size shall apply to brick burned to average hardness, with allowance for the usual commercial variations from such dimensions in brick harder burned or softer burned than the average.

STANDARD TERMINOLOGY.

(A) Type or Method of Manufacture:

Stiff Mud Wire Cut—A brick made by wire cutting, into brick sized units, a column of stiff plastic clay expressed through the die of an auger or plunger machine.

Stiff Mud Repressed—The above brick after being repressed in a press box.

Dry Pressed—A brick manufactured of finely ground, dampened clay, pressed in a press box.

Soft Mud—A brick made of clay mixed with water to a comparatively soft consistency and moulded directly in a mould, usually without repressing.

(B) Texture:

Smooth—A brick of any of the above types and having a relatively smooth surface on its face and heads.

Sanded—A brick coated with sand.

Water Struck—A brick of the soft mud type moulded in a mould dipped in water. This brick is often hand moulded and in any case is irregular in size and surface.

Rough, Vertical Texture—A brick having an artificially roughened surface with ridges and valleys extending in a vertical direction when the brick is laid horizontally in the wall. This brick is usually, but not necessarily, of the stiff mud wire cut type.

Rough, Horizontal Texture—A brick having an artificially roughened surface with ridges and valleys extending in a horizontal direction when the brick is laid horizontally in the wall. This brick is usually, but not necessarily, of the stiff mud wire cut type.

(C) Color:

The colors most used in the face brick business are red, buff, gray, iron spot and manganese spot. These names are self-explanatory.

In addition to the colors themselves the following expressions are in common use:

Clear Color—A brick with a clear color and without flash.

Fire Flashed—A brick which has been subjected to a "reducing" action of the fire thereby bringing out the iron in the clay and producing darker colors on the faces and heads of the brick than is produced in the interior of the brick, i. e., a color skin deep only.

The Closing Session.

The final session was held at 10:30 a. m., December 14th. The two feature numbers on the program were a discussion of the subject of federalizing the building industry, by A. B. Black of the American Contractor, and a lengthy opinion and explanation of the open price plan and the law by Elmer H. Adams, of Adams, Crews, Bobb and Wescott, Chicago.

Mr. Black touched upon the diminished activities in the building world and suggested possible remedies. He gave it as his opinion that one, and perhaps the main cause for the present situation, is in the fact that the people as a whole do not appreciate the bigness or the magnitude of the building industry. There is a too general disposition to regard the building business as a local industry, that is to see only local building operations and not encompass in our mental vision the building industry as a whole. He told of plans on foot to call a meeting of all the different lines interested in the building industry at New York with a view to getting more co-ordination, in brief, to federalize the industry and get at the bigness of it and put it in such shape that it will have a voice and can say more effectively what is needed to be said on an occasion of this kind for the welfare of the business.

The election of officers which was scheduled as the last item, really took place between this number on the program and the talk by Mr. Elmer Adams. President Bass explained that the brick dealers wanted to be in to hear the talk on the open price plan and the law, and while waiting for them to come in the nominating committee made a report recommending the re-election of the old officers, and directors with a few changes as indicated on the following page.

Elmer H. Adams started off with a variation on the joke of the Adams family, added a bit of touching poetry, then he said he believed that the banks had hurt the building industry by curtailing loans for building operations, and suggested that when they call that meeting in New York a bank representative should be present. Then he went into the matter of the Sherman Law and the many rulings and opinions about it. Also he reviewed the remarkable changes which have taken place in the government sentiment.

A few years ago as we all know, there were prosecutions and persecutions of almost every organization, but lately a complete change has taken place, especially since the formation of the Federal Trade Commission, and the government is encouraging organization and actually pleading for a pooling of the railroads, whereas, for years they fought all such propositions.

Then touching the matter of the open price plan, he told of what had been done in the salt industry by daily sales reports, in the coal industry and other lines, and expressed the opinion that there is nothing illegal or improper about the plan of making daily reports of sales including quantity and price to a central bureau. These price comparisons, he says, are not only legal but they stop disastrous price cutting and work toward greater efficiency in the industry.

The A. F. B. A. does not indulge in Receptions, Banquets or similar entertainments but the lack of same is not noticeable with good fellows who find shop talk and personal chit chat all sufficient.

OFFICERS AND DIRECTORS OF AMERICAN FACE BRICK ASSOCIATION.

President, George A. Bass, St. Louis, Mo.

1st Vice-president, S. C. Martin, Pittsburgh, Pa.

2nd Vice-president, J. M. Adams, Columbus, Ohio.

Secretary-Treasurer, R. D. T. Hollowell, Pittsburgh, Pa.

Directors—F. W. Butterworth, Danville, Ill.; J. W. Moulding, Detroit, Mich.; Chas. C. Stratton, Bradford, Pa.; W. H. Brecht, Boone, Iowa; H. R. Beegle, New Galilee, Pa.; J. H. Black, Buffalo, N. Y.; W. H. Hoagland, Columbus, Ohio; H. S. Hamilton, McArthur, Ohio; R. W. Ballou, Buffville, Kas.; T. P. Cuthbert, Pittsburgh, Pa.; J. Parker B. Fiske, New York, N. Y.; P. B. Beldem, Canton, Ohio.

PERSONAL ENCOUNTERS AT FRENCH LICK.

A. S. Reid, retiring President of the Face Brick Dealers' Association demonstrated his loyalty by making a long distance trip to the meeting.

A. E. Huckins, of Champaign, Ill., helped prevent some good music from going to waste and started the crowd to really enjoying itself in the evening.

There were two perfect delegations at the dealers' meetings, that is two cities with 100 per cent. representations, those of Cincinnati and Buffalo.

Walter Purcell is President of the Cincinnati Brick Club, and H. Serkowich is Secretary. It is a 100 per cent. club too and full of life.

The Louisville delegation consisted of H. H. Frazier of the R. B. Tyler Co., and Isaac Tyler of the Tyler Building Supply Co.

B. E. Thompson, of the Rochester Clay Products Co., Rochester, Pa., says they have had a fairly busy year out their way. There has been some scarcity of help, and help and everything else has been high, but they have done very well.

J. Parker B. Fiske, of New York, says that the face brick trade looks rather blue in the New York territory. The common brick business is a little better off than face brick but the building industry as a whole has been side tracked for war work and there is not much doing.

N. R. McKown and wife registered from Greenfield, but Mrs. McKown insists that the head of the family spends most of his time at Indianapolis. As a matter of fact the Brooklyn Brick Co. with which he is associated, has offices in the Chamber of Commerce Building, Indianapolis.

A. B. Lyon, who holds down the Washington, D. C., end of the Hydraulic-Press Brick Co., says Washington is a place of heavy crowding now and war and war business overshadows everything else. The face brick business and the building brick business generally has been rather slow.

Thomas H. Simms, of the Brick Selling Co., Birmingham, Ala., says that at the moment the common brick business is fairly good in Birmingham, but the building outlook, broadly speaking, is not very bright nor has it been very active. Birmingham itself is in a flourishing condition but there is no boom on in building operations.

Clyde C. Murray, president of the Reynoldsville, (Pa.) Brick & Tile Co., was elected lucky man.

Chas. F. Herman, of the U. S. Brick Co., Tell City, Ind., had to nurse a crippled arm but that didn't keep him from being on hand at the gathering of the clans.

Senator G. W. McNees, Kittanning, Pa., says they have had a slow year, full of difficulties about getting help and help is very scarce and prices are exceedingly high.

Among the familiar faces missed and commented upon was that of Elisha K. Kane, of Kushequa, Pa. Mr. Kane is usually one of the very active participants in the face brick meetings.

J. W. Bostick, of the West Salem, Ill., Hollow Brick & Tile Co., says they have had a very good year. The business has come largely from the surrounding territory and from agents in the smaller towns and cities.

W. P. Varney, of Chicago, says that the face brick business has been a slow game in Chicago this year and they have no idea when to expect improvement.

Out of the western territory, Lincoln, Neb., was represented by F. N. Blanchard and G. N. Girard, and Kansas City, Mo., by F. C. Lafountain.

The Standard Brick Manufacturing Co., of Evansville, Ind., was represented by H. C. Kleymeyer and John Andres, who were looking cheerful enough to be busy, but they reported business mighty slow in Evansville this year. They are only operating one plant at the present time.

C. S. Nixon, of the Paine & Nixon Co., Duluth, Minn., was one of the few from the large cities which reported good business and fairly active building operations. He says that the steel industry and ship building at Duluth have stimulated building operations so that they have had a good year.

Jos. McKinney, of the B. Mifflin Hood Co., Memphis, Tenn., says they have lots of money in Memphis but building operations have been rather slow. Also he says that cotton is a good price but the cotton crop is so short that the agricultural people have not realized as they had hoped to.

Emil M. Kraatz, president of the Wisconsin Face & Fire Brick Co., Milwaukee, reports the unique experience of shipping brick in barrels to Brazil, South America. The brick shipment involved fire brick, common brick and face brick for use in setting up a boiler and machinery plant, the brick going along with the machinery.

F. G. Banker, Indianapolis, who has a plant at Brooklyn, Indiana, says they have an almost inexhaustible supply of easily worked shale. Where they are working now their shale bed is about 60 feet and they have all told a possible depth of 200 feet which makes up a non-cracking product and he believes it is almost ideally adapted to the making of hollow block, and consequently he is thinking of adding hollow block to his product.

That big sign of the Cincinnati Brick Club is getting to be a familiar one at face brick conventions. There were the names of seven firms upon it and every one was represented, and they had Secretary Senkonvich as an extra. The names were as follows:

Cincinnati Clay Products Co., John M. Stoner; D. C. Shorey Brick Co., D. C. Shorey; Purcell-Grand Co., Walter Purcell and Ed Grand; Builders' Material Co., J. A. Peters and W. J. Pugh, Jr.; Brick Sales Co., A. W. Riggs; L. H. McCammon Bros., C. E. McCammon; Moore-Coney Co., Ed. G. Pick.

Geo. P. Anderle, of the International Clay Machinery Co., Dayton, Ohio, was the only representative of the machinery contingent encountered at French Lick. He says they have been fairly busy with brick machinery. Some people seem to have a mistaken idea that the machinery people are all making munitions, but as a matter of fact while they are making some shells their main energy is devoted to making machinery and they have been very busy at this, having recently installed for O. C. Barber Allied Industries Co., at Canton, Ohio, a 42 section producer gas fired tunnel kiln, the largest on record. Also they have had machinery orders from as far away as Cuba.

Thomas E. Dever, of Ricketson & Schwartz, Milwaukee, carries a brick on his card with the everlasting inquiry "Who Furnished The Brick?" This has proven to be a great advertising stunt, and they keep pulling others. They passed out advertising pencils at the convention. Also they were distributing a cigar clipper.

G. B. Luckett, of the Crawfordsville, (Ind.) Shale Brick Co., says they had a good first half of the year and this helped out considerably. Moreover the latter half has done better than they expected, so the year as a whole has treated them fairly well and they are working right along through the winter.

There was a pleasing representative of the ladies present, which was one of the best signs of the times. Among the ladies in attendance were:

Mrs. J. W. Waugh, Crawfordsville, Ind.; Mrs. R. R. Colburn, Minneapolis, Minn.; Mrs. F. G. Banker, Indianapolis, Ind.; Mrs. N. R. McKown, Greenfield, Ind.; Mrs. J. J. Neer, Atlanta, Ga.; Mrs. Douglas Stevens, Cayuga, Ind.; Mrs. C. E. Jewett, Nelsonville, Ohio; Mrs. R. D. T. Hollowell, Pittsburgh; Mrs. Jas. R. Thomas, Crawfordsville, Ind.; Mrs. Edna R. Gould, Indianapolis, Ind.

MEETING OF THE FACE BRICK DEALERS.

The Face Brick Dealers' Association held three sessions, elected officers and outlined plans for an active campaign of membership.

The dealers had no formal program made out in advance, but they are very resourceful boys, and when they got together they soon got to work and started things.

The first thing they started was the idea of building up a bigger membership to the end that they may do more effective work, and of getting a secretary from outside the industry.

It so happened that the Cincinnati delegation came along with that kind of a secretary of their own who proved to be the right man in the right place. So a committee on nominations was made up consisting of Isaac Tyler, W. R. Gifford and John M. Stoner, to name candidates for the offices. They soon agreed on the idea of enlisting the Secretary of the Cincinnati Brick Club as Secretary of the Dealers' Association. Then Tyler and Gifford put one over on Stoner by naming him for President, so that Cincinnati would have the whole working machinery of the organization and be in shape to carry on their plans better than if the officers were scattered. The result of it all was an election of officers and Vice-president as scheduled above.

The Cincinnati delegation, which captured the executive offices of the Dealers' Association is not only an enthusiastic group but it is also a patriotic one. The new President, John M. Stoner, said that the patriotic spirit is so strong with them that their first consideration, the thing which comes first in their thoughts and hearts, is winning the war. Nothing, not even the welfare of the face brick dealers and the Association, will be allowed to stand in the way of or to hamper in any manner the government or the activities of any of the war boards. Their idea is to co-operate with the government and the war boards in every way practical to the extent, where necessary, of curtailing their own business, because they realize that unless we win the war, business will not be worth much.

Their plans in general are to first strengthen their organization, that is to direct their energies toward building up a membership before undertaking to carry out specific plans of any other kind for the good of the order. It was this idea which led them into getting H. Serkowich to accept the Secretaryship of the organization. Mr. Serkowich is in charge of the extension department of the Cincinnati Chamber of Commerce and it was through his efforts in this work the Cincinnati Brick Club was formed as a sort of inner wheel in the brick industry of the Chamber of Commerce of Cincinnati. Since it was through the Chamber of Commerce of Cincinnati that the local brick people there were gotten together in a club, Mr. Serkowich has a plan in his mind of taking the matter up with secretaries of Chambers of Commerce throughout the country and asking them to try and get the brick people together locally, into local clubs, after which he figures that it will be comparatively easy to secure affiliation with the national organization and in this way they will all be benefitted.

Incidently it may be mentioned that Mr. Serkowich is interested in trade promotion all around, he is Consul at Cincinnati for Nicaragua, and has taken a very active interest in the work of developing larger trade relations between our people and that country.

The first two sessions of the Dealers' Association was given over to the election of officers and discussion of plans and suggestions for enlarging the organization and getting it in shape to do more effective work. Then on Thursday another short session was held in which they discussed tentatively plans and ideas for carrying out tihs work and building up the Association. They all expressed a feeling that they had gotten things in shape to do something and by the time another year rolls around the dealers will be able to make a splendid showing.

President, Jno M. Stoner, Cincinnati, O.

Secretary-Treasurer, H. Serkowich, Cincinnati, O.

Executive Committee—A. S. Reid, Newark, N. J.; J. W. Morrison, Detroit, Mich.; W. H. Gifford, Chicago, Ill.

Vice-presidents (one from each state)—A. E. Harding, Boston, Mass.; F. B. Freeman, Pittsburg, Pa.; B. Mifflin Hood, Atlanta, Ga.; F. N. Blanchard, Lincoln, Nebr.; James Morrisey, Cleveland, O.; E. F. Dartnell, Montreal, Quebec, Canada; R. Howard, Chicago, Ill.; A. E. Bradshaw, Indianapolis, Ind.; John H. Donahue, Jr., St. Paul, Minn.; Frank Schaeffer, Detroit, Mich.; E. Kraatz, Milwaukee, Wis.; Thos. Simms, Birmingham, Ala.; Alfred Tyler, Baltimore, Md.; D. W. Clark, Buffalo, N. Y.; I. H. Tyler, Louisville, Ky.; A. S. Reid, Newark, N. J.; G. J. Grinnan, Norfolk, Va.; Walter Jahncke, New Orleans, La.

WAR SAVINGS AN EPOCH IN OUR NATIONAL LIFE.

Secretary McAdoo has issued the following statement:

War savings is an epoch in our national life. Every man, woman and child can now join the growing army that provides the sinews of war, for war-saving stamps make it possible for every loyal citizen to do his part, no matter how small that part may be.

The American people have accepted the challenge of autocracy and have resolved to make the world safe for freedom and democracy. The days of autocracy are numbered, and our men, our industries, and our money are marching forward with irresistible force to accomplish that purpose.

Let us remember that dollars buy the finished article that is the product of American labor and American materials, and that American labor and materials are today essential for the making of supplies of all kinds for our army and navy, and that every dollar diverted from the purchase of articles not needed for our health and efficiency helps the Government to that extent to procure things that are essential to win this war.

The war saving campaign marks the beginning of a new and I hope permanent evolution of American life. Self-sacrifice and self-denial have always made real men, and real men are basis of strong nations.

Those of us who help to lay the foundation stone of thrift will be the builders of a structure that will survive through all time, and will be rendering a service of the utmost importance to our flag and country.

OFFICIAL ANNOUNCEMENT.

THE THIRTY-SECOND ANNUAL CONVENTION OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION WILL BE HELD IN INDIANAPOLIS, IND., FEBRUARY 10 TO 16, 1918.

THE AMERICAN CERAMIC SOCIETY, NATIONAL PAVING BRICK MANUFACTURERS' ASSOCIATION, AND OTHER ALLIED ORGANIZATIONS WILL MEET AT THE SAME TIME.

AS PREVIOUSLY ANNOUNCED, the thirty-second annual convention of the National Brick Manufacturers' Association will be held in Indianapolis, but to accommodate those associated with the clay schools and the American Ceramic Society, it has been found necessary to defer the convention a week. Instead of meeting the first week in February, as originally announced, the convention will be held the second week, February 10 to 16 inclusive.

Claypool Hotel, Headquarters, Thirty-second Annual N. B. M. A. Convention.

As in former years, the American Ceramic Society will hold its sessions Monday, Tuesday and Wednesday forenoon. The National Paving Brick Manufacturers' Association will hold its sessions Monday and Tuesday, and there will be meetings of kindred associations, such as the Drain Tile Manufacturers, the Hollow Block Manufacturers, the Indiana Division of the American Face Brick Association, etc., on the same dates.

The formal sessions of the N. B. M. A. will begin Wednesday afternoon and continue Thursday and Friday. All the meetings will be held in the convention halls and assembly rooms of the Claypool Hotel, which will be headquarters and which affords unexcelled facilities for all such gatherings, whether large or small.

The Claypool Hotel Headquarters.

A large attendance is anticipated, and it is therefore advisable to request reservation of such accommodations as may be desired at an early date. In writing in regard to rooms, etc., the date of intended arrival should be mentioned together with the number in party and character of accommodations desired. The Claypool Hotel has an unusual number of large rooms with bath, so that parties desiring to room together may be accommodated, and single beds furnished when desired. If single rooms ensuite are preferred, they may be had for the asking. The rate will be from $2.00 up, on European plan, according to location, etc. For reservations, address the Claypool Hotel, Indianapolis, or Secretary Theo. A. Randall.

The grave and important problems that now confront every branch of the clayworking industries make it exceedingly desirable for the representative men in each branch to meet and consider carefully the new conditions under which plants must be operated and products marketed. Never before was there a more urgent need for exchange of views on the various questions which are now perplexing the wisest and most experienced manufacturers in the land. Be it remembered that "in a multitude of counsel there is wisdom." Every member is expected to be present and do his bit toward meeting the new conditions in a manner most apt to spell the largest measure of sucecss during the following season.

A large attendance is hoped for and a warm Hoosier welcome awaits each and every visitor. Those desiring further information relative to the program of events or the requisite of membership in the various bodies will please write the Secretary at Indianapolis.

THE EXECUTIVE COMMITTEE.
FRITZ SALMEN, President.
THEODORE A. RANDALL, Secretary.

CONVENTION DATES.

Northwestern Clay Association, West Hotel, Minneapolis, Minn., January 17 and 18, 1918. R. H. Smith, Secretary, 4728 Lyndale avenue, Minneapolis, Minn.

Iowa Clay Products Manufacturers' Association, Des Moines, Ia., January 23 and 24, 1918. Homer F. Staley, Secretary, Ames, Ia.

Wisconsin Clayworkers' Association, Republican House, Milwaukee, Wis., January 31 and February 1, 1918. Samuel Weidman, Secretary, Madison, Wis.

Sand Lime Brick Manufacturers Association, Lafayette Hotel, Buffalo, N. Y., January 29 and 30, 1918.

Canadian National Clay Products, Prince George Hotel, Toronto, Ontario, Canada, January 29, 30 and 31, 1918. Gordon C. Keith, Secretary, Toronto, Ont., Canada.

American Ceramic Society, Claypool Hotel, Indianapolis, Ind., February 11, 12 and 13, 1918. Arthur S. Watts, Secretary protem, Ohio State University, olumbus, Ohio.

National Paving Brick Manufacturers' Association, Claypool Hotel, Indianapolis, Ind., February 11, 12 and 13, 1918. Will P. Blair, Secretary, Cleveland, Ohio.

National Brick Manufacturers' Association, Claypool Hotel, Indianapolis, Ind., February 13, 14 and 15, 1918. Theodore A. Ramdall, Secretary, Indianapolis, Ind.

NATIONAL ASSOCIATION OF DRAIN TILE MANUFACTURERS TO MEET FEBRUARY 12th, 1918.

The National Association of Drain Tile Manufacturers which has been in the process of formation for many months past will become a full fledged organization February 12, 1918, in Indianapolis. At a meeting held in Chicago at the LaSalle Hotel, December 5th, delegates from the various state Associations met, devoted the day to the discussion and consideration of matters of vital importance to the industry and concluded their deliberations by forming a temporary organization, to handle the details and work incident to the forming of a national body. Delegates representing the states of Indiana, Illinois, Iowa, Ohio and Wisconsin were present, and the results of the meeting were very gratifying to all present.

The coal and car shortage problems, which have been given careful consideration by all the state organizations, were thoroughly discussed and the consensus of opinion was, that the question should be solved through a National Organization which would have more influence than any individual or state body with the powers that be in Washington.

Some very effective work has been done and much of interest to the drain tile manufacturers of the country will therefore be reported at the meeting in Indianapolis, February 12th.

A National Association of Drain Tile Manufacturers is an absolute need. All those who have not yet taken membership should communicate with the Secretary, Mr. J. E. Randall, care of The Clay-Worker, Indianapolis, Indiana.

CHICAGO SECTION OF THE AMERICAN CERAMIC SOCIETY.

On Saturday, December 29, at the Ft. Dearborn Hotel, Chicago, will be held the second meeting of the newly organized Chicago section of the A. C. S. The meeting will start with a luncheon in Parlor A, at 1 o'clock, followed by a short business meeting, after which the following interesting program will be held:

1. "A Review of Recent Ceramic Literature," by Prof. C. W. Parmelee, University of Illinois.
2. "The Fitting of Enamels to Metals," by R. R. Danielson, Ceramic Chemist, Royal Enameling Company.
3. "Then What?" by W. D. Gates, president American Terra Cotta and Ceramic Company.

It is also expected that Mr. A. De Gallaix, a former Belgian manufacturer of ceramic products, whose factory was destroyed in the war, will be present. He is an expert in chemical stoneware, glazes and graphite crucibles.

Wisconsin Clayworkers Will Meet January 31 and February 1.

Editor The Clay-Worker:

The eighteenth annual convention of the Wisconsin Clay Manufacturers' Association will be held in Milwaukee, January 31 and February 1, 1918. Headquarters will be at the Republican House. A full attendance of Wisconsin brick and tile manufacturers is urged, as very important subjects of special interest at this time will be discussed.

Milwaukee, Wis. S. WEIDMAN,
Secretary.

Northwestern Clay Association to Meet in Minneapolis.

Editor The Clay-Worker:

The meeting of the executive committee of this association held last week has decided to call the 1918 convention for January 17 and 18 at the West Hotel in Minneapolis. On account of the unusual business conditions, and especially those existing in the clayworking field, we are extremely anxious to have a good attendance, and with that in view we are endeavoring to arrange an especially interesting program. Thanking you for any publicity which you can give, we are,

Yours truly,
Minneapolis, Minn. R. H. SMITH, Secretary.

WANTS BIDS FOR MATERIAL FOR NEW PLANT.

Editor The Clay-Worker:

It may be interesting to your readers to know that we are soliciting bids at this time for material, as we will extend our plant and add to our foundry building a steel extension, brick and metal sash siding, also large core oven, ten-ton and two-ton electric cranes; also will erect a two-story fireproof pattern storage, pattern shop, stockroom and garage building.

Yours truly, T. F. PHILIPPI,
President Excelsior Tool and Machine Co.
East St. Louis, Ill.

WOOD SUBSTITUTED FOR BRICK TO SAVE TIME IN BUILDING TEMPORARY WAR STRUCTURES IN WASHINGTON.

Editor The Clay-Worker:

The great temporary structures of the War Department, covering the government reservation in Washington, upon which was formerly located the Pennsylvania Railroad Station, at Sixth and B streets, are now completed—in exactly fifty-nine days from the date the work began.

The buildings cover more than four city blocks, extending from Sixth to Seventh streets, B street to the Fish Commission. They are four stories in height in the main sections. The material used throughout is Georgia pine, with pebble dash exterior finish; the interior is in the natural wood. The cost is $2,000,000.

"It has been simply a matter of time," said the George A. Fuller Company, the builders of the structure, "that made necessary the use of wood, and it is needless to say that if the buildings had been intended for permanent use wood would be entirely out of the question. In order to put up such a building as this of brick would require at least a year and necessitate a much larger force of workmen than we used on this job."

This applies as well to the two great buildings just west of the D. A. R. Memorial Hall, on Eighteenth and Nineteenth streets, just finished, and occupied by the Council of National Defense and the Ordnance Bureau of the War Department, respectively. The latter buildings cost $1,200,000 each, and are similar in design to the War Department buildings on the old depot site above referred to.

All of these buildings are for use during the period of the war only, and will be removed following the coming of peace.

Washington, December 15, 1917. M. A. T.

The foregoing is ample reply to would-be critics who have tried to create the impression that if sufficient "organized" influence had been exercised at the National Capital, these great buildings might have been built of brick. Such criticism is mendacious and is proof of a lack of information or of utter insincerity. These great temporary buildings are needed to house the thousands of officials and clerks who have been called to Washington for service during the war. That they have been completed in two months' time is a matter of patriotic pride.—Editor.

Our enterprising St. Louis friends, the Laclede-Christy Clay Products Co., have issued a very graphic warning for the next year that if we don't watch out war taxes and other added burden will swallow up the profits of business. It is time to work for greater efficiency and to exercise vigilance on the added items of cost.

Written for THE CLAY-WORKER.

THE CHICAGO SITUATION.

THE BUILDING SITUATION in Chicago shows no improvement as the year draws near to a close. In fact, if anything, it shows a further falling off, at least so far as number of building permits indicates. There is a modicum of encouragement in the fact that the estimate cost of contemplated improvements shows up better in comparison with figures for corresponding periods of a year ago, than does the number of such improvements, but it must not be forgotten that to some degree, at least, the greater proportionate cost of, in any such comparative tabulations, is due to the greatly increased cost of some materials and a good deal of labor. During the month of October not even this crumb of comfort was to be seized. During that time the total cost shown in the permits was only $2,756,700, as compared with $11,408,300 for October, 1916. November made a somewhat better showing, with an estimated expenditure of $4,740,100, as compared with $10,056,100 for November, 1916. The number of permits was only 392, as compared with 760 in November a year back. For the eleven months of 1917, the figures are: Number of permits, 4,884; frontage involved, 155,813 feet; total estimated cost, $60,905,850, as compared with 9,721 permits, 308,648 feet frontage and $106,982,650 in approximate outlay for the first eleven months of 1916. A regular gloom-spreader would take further joy in pointing out that 1916 was no banner year, either.

It is, however, no time to be pessimistic. The period is so unusual that if business were "as usual" we should be constrained to suspect that something was very wrong. The attempt to maintain "business as usual" in Great Britain during the early days of the great war is now regarded as having been in many ways a great mistake. Economists have discouraged it in this country.

As might be expected, the clayworkers are among those who are able to see at least one jump ahead of the game and to make the necessary adjustments. Their feet may be stuck in the clay, but their heads are not, and they can shake a foot in whichever direction seems best at a given time. It is noticeable throughout the country, of course, that industrial construction is far outrunning the general line of building. Residence building, office building and other lines make but little demand for building material just now, and probably will not for some time to come. Factories and industrial plants, however, are expanding constantly and new ones are being built for new enterprises connected with war-time production. As a result, of course, the demand for face brick is actually lower than it has been in probably fifteen years, while the demand for fire brick and fire-proofing promises to be heavier than ever before. As a result we find many plants which have made a considerable name for themselves as manufacturers of high-grade face brick now turning from the manufacture of the more ornamental commodity to the production of the more utilitarian which is, at this time, of greater service to the country and the cause, and, incidentally, to the foresighted manufacturers.

It should not be inferred that building work in Chicago is at a standstill. A great deal of work of a general character is under way and definitely contemplated. A great deal of public improvement is planned and there is much discussion as to what projects are legitimate for war time and which ones should be deferred until after peace is restored throughout the world. The most recently announced plan is that for the regeneration of South Water street, from State street to Market street. Except indirectly it does not interest the brick and clay man, but ultimately undoubtedly it will lead to much new construction, in which brick and terra cotta and fireproofing and tile will be largely used. The plan is to convert into street space all of the property between the river and South Water street; to double deck the street at the height of the bridges, using the upper level for the light and the lower level for the heavy traffic. This would connect the Illinois Central freight and the lake front warehouses and manufacturing districts with the west side railways and industrial zone. The lower level would be used for water and rail freight transfer and team track facilities. Also it might be used as a public parking space for automobiles, whereby it is estimated the city might derive new revenues of $121,000 a year. Doing away with the present mess of markets, which, it is believed, will largely be crowded out in a few years anyway, and widening the thoroughfare so as to make it a water front driveway, will, it is believed, make this stretch of street one of the show places of Chicago, closely vying with Michigan avenue. If this prophecy of the Chicago Plan Commission is fulfilled, it will mean, of course, the early construction of many fine buildings along the south side of the reconstructed street.

A fine, high-grade apartment building of brick construction will be know as the "Firwood," to be erected at a cost of about $250,000, in Sheridan road, between Pine Grove and Clarendon avenues. It will be six stories high and stand on a lot 100x175 feet. It will contain thirty-six two-room and twenty-four three-room apartments. The erection of this apartment is regarded as marking a distinct trend toward the apartment hotel type of residence building, and is expected to meet the demand of war conditions for compact quarters and a greater economy on the part of tenants as to domestic expenses. Each apartment will have at least one living room, a breakfast room, kitchenette and a bath, a large dressing closet and one or two disappearing beds. It is being erected by A. Irving Jordan, the builder.

The Chicago Plan Commission was mentioned in connection with the proposed improvement of South Water street, and it is interesting to note the influence which this unofficial commission is having in the development of architecture in the city. The Commonwealth Edison Company, for example, which has about fifty substations about the city and is constantly adding to the number, is endeavoring to keep its buildings up to the high standard of architecture encouraged by the commission. The most recent instance is the new Clifton avenue station at Montrose boulevard, just across the street from the Graceland cemetery. At first some of the residents in the neighborhood were opposed to the location of the station there, on the ground that it would be a nuisance, but the attractive character of its design, together with its carefully kept lawns, have caused it since completion to be regarded as a decided advantage to the neighborhood. It is of dark colored brick, relieved with chromatic adornment. This station supplies about 35,000 kilowats of electric energy.

One of the larger industrial projects of the month is the plan for a garage, costing $400,000, to be erected for Marshall Field Co., on a block of ground bounded by Jefferson and Desplaines and Polk streets and Gilpin place, which the company has just purchased from the Pennsylvania railroad company for $250,000.

A high-class family hotel, to cost about $600,000, is planned to occupy the site of the old Warren-Leland homestead at the northeast corner of Drexel boulevard and Forty-seventh street. It will be erected by Sherman T. Cooper, who is erecting the twelve-story Cooper-Carlton Hotel at the southeast corner of Hyde Park boulevard and Fifty-third street, costing in the neighborhood of $1,250,000. The new hotel, which will be called the Cooper-Monetah, will be six stories and basement.

Many more specific instances might be cited to show that things are not wholly gone to seed here in Chicago, but the foregoing will suffice. It is believed that the coming year will see affairs on the way to a more satisfactory readjustment and that a better balance in building, as in other lines of trade and commerce, will be maintained in 1918.

SCRIP.

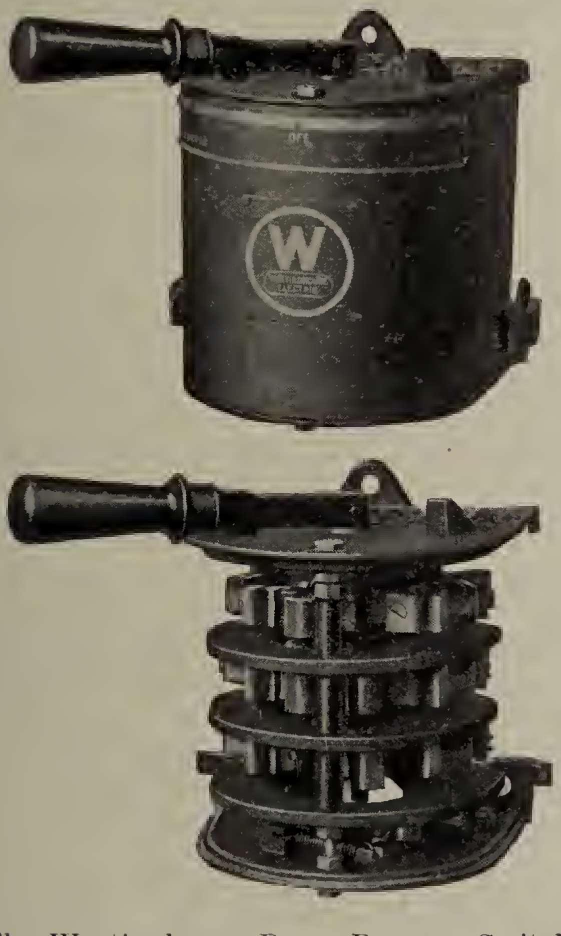
DRUM REVERSE SWITCH.

ONE OF THE latest products of the Westinghouse Electric and Manufacturing Company is a small drum reverse switch (Type 810), for operating motors in machine tool, wood-working and other services requiring reversing of the motors. The small size and neat appearance of this reverse switch make it especially adapted for mounting directly on the machine. Notwithstanding its small size, this switch is exceptionally rugged and has proven successful in the most severe services.

A terminal board of heavy micarta forms the back of the switch, and on the front side of this board are mounted the stationary contacts.

The movable contacts are mounted on cast brass brackets clamped on the shaft, from which they are thoroughly insulated.

Good contact is insured by phosphor-bronz springs, on the movable contacts, these being protected by copper shunts.



The Westinghouse Drum Reverse Switch.

Heavy barriers of asbestos lumber separate adjacent sets of contacts so that cross-arcing is impossible.

All live parts are protected from exposure by an enclosing cover of sheet steel, lined with asbestos and held in place by two ring latches, which permit its easy removal for inspection or renewal of contacts.

These switches are made for alternating-current or direct-current circuits. For alternating-current service and for direct-current service without dynamic braking, they are provided with "Forward," "Off" and "Reverse" positions. For alternating-current service the motor is connected directly across the line.

For direct-current applications with dynamic braking, the switch handles have five positions, as follows: "Forward," "Drift," "Off and Brake," "Drift" and "Reverse." They may be used with automatic starters for shunt and compound-wound motors having heavy series winding for tail-stock and cross-rail service, they may be used to connect the motor directly to the line, either with or without resistors permanently connected in series with the armature.

When remote mechanical control is desirable, both alternating-current and direct-current switches can be furnished with extended shaft, permitting either gear or sprocket operation.

HOW SHALL THE WAR HIGHWAYS BE DETERMINED?

Chambers of commerce, boards of trade and local associations of manufacturers throughout the country can be of material help in relieving transportation congestion by furnishing to the highway departments of their respective states data as to the highways which can be most useful as substitutes for congested railway routes. This can be done by calling meetings of the traffic managers of the industries, and having them, through a committee, determine the public roads whose maintenance and improvement is most important.

Such a procedure would be in conformity with plans formulated by the American Association of State Highway Officials at a meeting in Richmond, December 4, and now endorsed in effect by the Office of Public Roads. The plan provides for the preparation of a program for the improvement and maintenance, in the order of their importance, of the highways which are of greatest economic value in the present crisis. Should shortage of materials and labor require priority ruling on all highway work, the program would then be presented to the authorities at Washington as a basis for national approval and authorization of work on the essential routes. Should no priority ruling interfere the plan would nevertheless insure to the committee the expenditure of funds where it will be of the greatest benefit to the industries and people of the state.

Concerning this subject, Engineering News-Record will say this week:

Evidently, if the information is to be secured at maximum speed, it is necessary to call upon those who are constantly dealing with transportation matters and who, therefore, are informed regarding the relative congestion and importance of various routes. Manifestly, these are the traffic managers of the various industries and the railroads themselves. Before the war it would have been futile to ask the railroads to supply such information. Now, they eagerly welcome any agency which can help them out of their difficulties.

To secure the help of the traffic managers of the industries, the chambers of commerce, boards of trade and manufacturers' associations throughout the country can be of tremendous assistance. They are organized for work among the manufacturers of their respective communities and can at once secure immediate attention and action. They have the organization machinery for just such work. Moreover, they are seeking opportunities to serve the nation. * * *

We, therefore, commend to the consideration of the various state highway departments the plan of calling upon the dominant commercial bodies in the cities of their respective states for assistance in gathering the data for the highway war plan. That they will receive a prompt and effective response is certain.

AUGER BRICK MACHINES AND PUG MILLS.

An interesting booklet, profusely illustrated, has been printed by the Bonnot Company, Canton, O., describing the salient features of their mammoth auger brick machines, which they make in varying capacities ranging from 2,500 to 12,500 standard brick per hour. A complete line of pug mills is also illustrated. Readers of the Clay-Worker who are in the market for anything of the sort are requested to write the Bonnot Company, whose ad appears on page 503 of this issue, for a copy of the booklet.

THE CLAY-WORKER

Entered at the Indianapolis postoffice as second-class matter.

A Practical Illustrated Monthly Magazine, devoted to Brickmaking and allied Clayworking Arts and Industries.

THIRTY-FOURTH YEAR OF PUBLICATION.

OFFICIAL ORGAN OF THE NATIONAL BRICK MANUFACTURERS' ASSOCIATION OF THE UNITED STATES OF AMERICA.

TERMS OF SUBSCRIPTION:

One copy, one year (in advance)	$ 2.00
One copy, one year (if not paid in advance)	2.50
Six copies, " "	10.00
Ten copies, " "	15.00

Foreign subscriptions 65 cents additional.

☞Subscribers when ordering a change of address should give both the old and new address.

ADVERTISING RATES

Furnished on application. The CLAY-WORKER is unquestionably the most effective medium in its field, and character and circulation considered it is the cheapest. To insure insertion in current issue, advertising matter should be sent to office of publication on, or before the first of the month.

Correspondence on all subjects of interest to Clayworkers solicited. All communications should be addressed to

226 East Ohio St. T, A. RANDALL & CO. [Inc.], Indianapolis.

Vol. LXVIII. DECEMBER, 1917. No. 6.

My Country, Right or Wrong—My Country!

CURRENT COMMENT.

A Merry Christmas and a Happy New Year to every reader.

* * *

There is an evident need to train some brick contractors as well as bricklayers.

* * *

Let us persist in teaching the doctrine that brick building is the great safeguard against the firebug.

* * *

The new year ought to be a big one in the drain tile business and the business push ought to start early.

* * *

These are piping days for the miners of coal, but it is a chilly time for the consumer who pays the bill, the freight and the war tax.

* * *

The proposition to close down all factories for two weeks at the end of the year is one of the best that has been offered. Not only will it give a chance to relieve railway congestion and furnish an opportunity to clean up and make repairs, but the holiday season interrupts work so much anyway that there will be but little actual loss of factory output.

* * *

One of the prime factors in army training is teamwork, and this can also be made an effectively useful idea in business practice.

* * *

Yes, we are going after peace with a good will—because of the realization that there is a job to be done before it can be brought to earth.

* * *

Good belting costs enough these days that it pays to take good care of that you use, both while running and while you shut down for the winter.

* * *

Mark up your new calendar with those dates, February 10-16, for the N. B. M. A. meeting at Indianapolis, with the Claypool Hotel as headquarters.

* * *

There is a big building week campaign scheduled for early next spring. Is the brick fraternity going to climb into the band wagon or bring up the rear?

* * *

The American Ceramic Society is deserving of a larger membership. Come early convention week, that you may give it the encouragement of your presence and membership.

* * *

If they would just add to that shark skin leather industry the hides of some human sharks we have met and heard about, the supply would be augmented without the world suffering any serious loss.

* * *

During the months of January and February there is a great list of conventions of retail lumber dealers booked. Why not get in touch with and attend those in your territory to promote interest in clay products?

* * *

Never has there been a time of more serious questions needing the counsel of multitudes, nor a greater need for serious work at conventions. Let us all put aside pet theories and personal hobbies, attend convention sessions and wrestle earnestly with the many problems of the day.

BRICK BUILDINGS DO NOT DEPRECIATE.

When it comes to the annual taking up of the subjects of depreciation and appraisal, the brick man has a twofold interest to look after. He has the usual matters of depreciation and appraisal of buildings and equipment in his own plant. Then he has, or should have, interest in the fact that where other factory buildings are made of brick the depreciation per year is much less than if made of flimsy material, or of something likely to catch fire and burn. It is a good time to remind factory owners that a brick building may be worth more after ten years of service than its original cost.

THE TRUTH ABOUT THE $2,000,000 GOVERNMENT BUILDING.

On a preceding page our Washington correspondent gives the pertinent facts in regard to the much talked of $2,000,000 building recently erected by Uncle Sam for his great army of clerks now gathering in the National Capital. In this operation, as in many other things, time was an all-important factor, so these buildings had to be rushed. That they were completed, ready for occupancy, in fifty-nine days is in itself a remarkable accomplishment. They cover an area equal to four city blocks and afford very comfortable office quarters for thousands of workers. During a recent visit to Washington we were impressed with the many difficulties which confront government officials, who have made a human bee-hive of that city. Major Edward Orton's experience is typical. He was called there in August from Texas and assigned duty with other engineers to standardize automobile trucks for army purposes. His offices were moved three times in as many months, and he is now located in rooms in the Union Station. Major Orton, in common with every one connected with the government service, realizes as never before that war is all that Sherman said it was. If some of the self-appointed critics had a better understanding of the real situation in all government departments, there would be less criticism and more patriotism, maybe.

OUR PATRIOTIC DUTY.

Let the spirit of patriotism and co-operation prevail as the keynote for the new year. Our first duty is to win this war. This is a duty that takes priority over the maintenance of business activities in all lines. We should all seek earnestly to keep business in good shape and our civil industries alive. Yet in so doing let us not hamper or harass the government or the war boards in any way. Let us, rather, seek to co-operate with and assist them, even though some business may suffer temporarily as a result. Our first duty is the patriotic one of helping the government and our fighting men win the war. We can perform this duty and give at the same time reasonable attention to our business interests. But let us not for one moment forget that our duty to the country's war needs comes first.

PUSHING THE BRICK PAVING IDEA.

Several interesting suggestions were advanced at the recent meeting of the National Paving Brick Manufatcturers' Association to further the good work of pushing the brick paving idea, especially for roadways. There is entering now, among other things, the question of taking up contract work to help out in some cases. Perhaps one of the most interesting phases was that touched upon by Secretary Blair, in the matter of reaching the influential citizens among the public at large. The doctrine of the brick paved highway has already been pretty thoroughly preached to the engineers and highway officials, and now what we need is an awakening of public sentiment through reaching and interesting influential citizens in every community. After all, the highways are for the benefit of the public, and the public is entitled to know something about the best highway in advance of its building. Moreover, when public sentiment is once crystallized in favor of the best, it is apt to be a dominant factor in the determining and selection of material and the method of building.

GOING THE GOOD ROADS WAY.

For the sake of relieving congestion on the railroads, quite a lot of freight traffic that might go by rail is going the good roads way. Moreover, in those parts of the country where good roads prevail is where it is most easily practical to help solve the transportation problem with the use of motor trucks. Quite a lot of the congestion at seaboard points has been relieved to an extent by motor trucks, and manufacturers near export points have been able to send their product direct to the embarkation points by motor instead of by rail. Besides, there has been a great increase of direct delivery in many interior sections of the country through the use of motors going the good roads way. In view of all this, and the importance of good roads in getting agricultural produce to markets, it is a bit hard to understand the wisdom of curtailing good roads building through priority orders of one kind and another about transportation. We may have to put some of the road building into slow gear for a while because of lack of material and labor, but surely this is no time to let up entirely and abandon the splendid line of work which means a lot to our military operations as well as the future good of the country.

THE PINCH OF FUEL AND TRANSPORTATION.

The present indications are that the authorities at Washington will not list specifically certain industries as non-essential, though fuel restriction and priority shipping orders for what are considered the essentials will tend to pinch down on all industries not considered essential. Some which require coal for fuel in their operations are perhaps unnecessarily apprehensive about getting this shut off. The present indications are that there will be coal enough to fairly serve all the needs of the country, and the main pinch here will come from exacting of unnecessarily high prices. Wages have been advanced to miners until the coal miner of today is able to make from $10 to $12 a day digging coal; the operators have added to their profits on top of this, until the consumer is held up for a price that is burdensome and may continue burdensome until the war ends. It is this high price of fuel and of the difficulties of securing cars for transportation that will furnish the hardest pinch to some lines of industry, including various branches of clayworking. Let us hope, however, that by the pooling of the railroads and increasing their facilities the congestion of traffic will not be so great as was anticipated. Meantime how to keep various lines of industry moving as they should to maintain the prosperity and integrity of the country is something of a problem that calls for attention at conventions and co-operation all around on the part of the trade.

BRICK AMONG THE ESSENTIALS.

There seems to be in the public mind a mistaken idea that brick making belongs to the non-essential industries which ought to be slowed down during the war period. Facts are developing which show that brick, not merely fire brick, which is recognized as an essential, but building brick, may also well be classed as one of the essentials to the welfare of the country and the progress of our war plans.

An interesting side line on this was furnished recently by a news item to the effect that bricklayers are wanted to enlist in the army. These men are to be sent to concentration camps in the south for a short time, then to France for work on the American airdromes. They might also have added that at every camp and cantonment some brick and bricklaying is necessary, not only in the preparation for baking, but also in the making of incinerators. Then, in addition to these direct uses, we have plenty of evidence that brick is an important item in factory and warehouse building among those plants and places which are catering to war needs.

A number of letters have been received from brick manufacturers in the east, stating that their brick, hollow tile and other clay products are going direct into uses in connection with government work. Some report as much as 90 per cent. of their contracts at the present time of this nature, others a smaller percentage, and everywhere from all sides we are getting reports from brick manufacturers who are supplying their product either direct to the government or to contractors and industries which are engaged in government work or work to forward the manufacture of government supplies.

Many new warehouses have been acquired, new supply depots, factory buildings, and such a percentage of these have called for brick walls and brick construction in one form and another that brick may well be classed as one of the essential products, and the needs of the brick industry favored in the matter of fuel shipment and transportation where orders of this kind are being handled. The lumber people have made quite a noise about lumber and supplying war needs, while in the final analysis we will perhaps come to realize that brick has been playing a very important part and, as usual, without any brass band procession.

LOAD OF BRICK LOST IN GEORGIA.

People sometimes lose their minds, as well as their money and other valuables, but it remains for Valdosta, Ga., to furnish an unusual case of "lost" articles. An advertisement in a local paper, tells the story, thus:

"Lost—One load of brick, about the last of June. Thrown off in some yard on East Hill or East Savannah avenue by mistake."

The explanation being that a hauling firm sent out a load of brick and it was carelessly delivered at the wrong place, and driver does not know where he delivered it and the firm is appealing at this late date to the power of printer's ink tc recover the lost brick.

THE BRICKYARD GAZETTE.

Under the above head an interesting bit of trade literature is being published "every once in a while" by the Streator (Ill.) Brick Company and its employes. Wit and humor play a large part in its makeup. It announces as its motto, "Loyalty to the Company, Loyalty to One Another, Loyalty to Uncle Sam." Its official staff consists of Editor-in-Chief, E. F. Plumb; Assistant Editor, T. N. McVay; Business Manager, George Goulding; Sporting Editor, Del Merritt; Society Editor, Hazel Coulson; Literary Editor, L. Claypool; Reporter, F. Neumann. That the Gazette will prove a source of much pleasure and help to those interested goes without saying. It has already developed unexpected talent in the literary and poetic field, while its humorous news notes would do credit to Puck or Judge.

THE BOOK OF SMILES.

As usual, the current issue of the above publication is brimful of clever hits, beginning with, "Girls are in danger of freckled knees now that everything is so high," and ending with, "It's no use trying to fool the family next door as to who's the real head of your house." Speaking of brick dryers (see what Brickyard Bill says on page 520 of this issue), it states that the Standard Dryer makes brick manufacturers smile, and keep smiling.

> No matter how gloomy you're feeling,
> You'll find that a smile is most healing,
> If it grows in a wreath around the front teeth,
> Thus preventing the face from congealing."

PLANT TESTS FOR REFRACTORY BRICK.

Pointing out that tests to determine the physical properties and adaptability to particular service of silica, magnesite and fire-clay bricks may be conducted by any plant at small expense, H. C. Arnold, University of Illinois, Urbana, Ill., in a paper presented before the American Foundrymen's Association at its annual meeting in Boston, September 25, described some of these and urged that they be made by consumers. He stated that if operators would conduct such tests it would bring to them a more thorough knowledge of refractory materials; it would afford common grounds for discussion between the consumer and the producer, and would bring about a wiser and more profitable use of such raw materials. A thorough knowledge of material, Mr. Arnold believes, will help the consumer of refractories to produce a better grade of metal at a less cost. He also said that silica bricks are subject to permanent expansion on heating and that allowance should be made for this when the bricks are placed in the furnace wall.

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THE AMERICAN CLAY MAGAZINE.

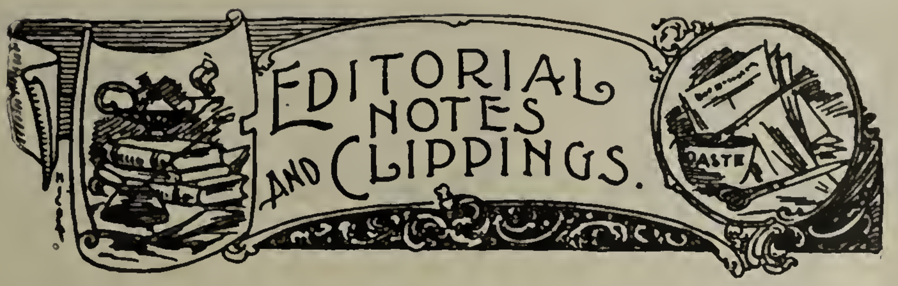
El Paso, Tex., believes in the benefits of brick construction, and consequently El Paso is practically a fireproof city, says the American Clay Magazine, which in its current issue has several illustrations proving that the way to prevent fires is to build of brick. A copy can be had for the asking. Address American Clay Machinery Company, Bucyrus, O. Its front cover illustration is quite unusual, and must be seen to be appreciated. Its squirrel poet remarks:

> "The man who builds a house of frame,
> To tempt decay and flame,
> May think he's saving money, but—
> He's 'squirrel food'—just a nut."

A Practical Hint.

"I can't for the life of me understand why the young folks prefer to spend their time in those dark dens of vice and watching the degrading motion pictures, rather than go to a pleasant, well-lighted church," remarked the pastor.

"Perhaps if you would darken the church they would like it just as well," retorted the lost soul.



EDITORIAL NOTES AND CLIPPINGS.

The Summitville Drain Tile Company, of Summitville, Ind., has increased its capital stock from $75,000 to $100,000.

The Hay-Walker Brick Company, of Pittsburg, Pa., recently filed a notice of increase in their capital stock from $80,000 to $350,000.

The General Fireproofing Company, Youngstown, O., recently distributed a bonus of $19,000 to its 530 employes.

The Eaglesville Brick and Tile Company, of Eaglesville, Tenn., has been incorporated, with $10,000 capital stock. J. E. Jackson, L. H. Lovelace, William Ralston and others are interested.

The Manatee River Pottery Company, of Bradentown, Fla., contemplates establishing a branch pottery at St. Petersburg, Fla. The company was recently incorporated with $10,000 capital stock.

Charles Klose, for a number of years connected with the Beatrice Brick Works, of Beatrice, Neb., and other clayworking enterprises, died at his home recently in Lincoln, Neb. A wife and four children survive.

The buildings of the Postville Clay Products Company, Postville, Ia., were badly damaged during a bad wind storm, which carried off the roof of one of the buildings and blew down one of the large chimneys.

The Southern California Clay Products Company has been incorporated by E. E. Maddison, J. W. Pemberton and R. B. Keller. The capital stock is given as $30,000, and the office of the concern will be located at Los Angeles, Cal.

The Copeland-Inglis Brick Company, Birmingham, Ala., recently booked an order for paving a ten-mile stretch of road in Florida, stretching from Kissimmee to Loughman, completing a stretch of 140 miles of brick highway extending from Tampa to Palatka.

The Tennessee Valley Iron and Railroad Company will build a brick plant at Collinwood, Tenn., with 40,000 daily capacity. Robert Dyas, of Nashville, will have charge of the construction of the plant and will be superintendent after the plant is ready for operation.

The Elk Fire Brick Company, with plants at Renovo, St. Mary's and Daguscahonda, Pa., recently gave a banquet to the business men of Renovo. All of the officers and directors of the company were present. J. D. Ramsay, president of the company, served as toastmaster. The company has had a most successful year.

The Mason City Brick and Tile Company, the North Iowa Brick and Tile Company and the American Brick and Tile Company, all of Mason City, Ia., have adopted the bonus system with their employes, and the first of December the three companies distributed checks amounting to nearly $35,000. The checks ranged from $40 to $100, according to the length and character of service rendered by the employes.

E. A. Hults, manager of the North Iowa Brick and Tile Co., Mason City, Ia., has been ordered to Washington to join the engineering corps of the aviation department, and will be stationed near that city. Mr. Hults is a graduate of the "Boston Tech." engineering department, and when the call came for volunteer engineers, he sent in his name. The call came Saturday and he left the next day for his new work of patriotic endeavor. He will retain his interest in the North Iowa and expects to return and resume his working connections with it when the war is over. He will be succeeded by W. S. Shutts during his absence.

The Hinde Brick and Tile Company, of Sandusky, O., was damaged $5,000 recently by fire of unknown origin.

The North Shore Tile Company, of Chicago, Ill., has been incorporated by C. W. Jurgens, Samuel Z. Pincus and Arthur E. Wallace.

The American Sewer Pipe Company, Pittsburg, Pa., has declared the regular quarterly dividend of 50 cents, payable December 20 to stock of record December 10.

The American Clay Machinery Company, Bucyrus, O., recently took a government contract for 500,000 six-inch shells and will equip a new department for their manufacture.

The J. B. Owens Pottery Company, of Zanesville, O., has recently taken over the Huntington (W. Va.) pottery plant and that of the New Lexington Pottery Company, New Lexington, O.

The Bingen Brick Works, at Bingen, was damaged to the extent of $10,000 recently by a fire of unknown origin. The tool house, machinery house, sand houses and half of the dryer buildings were consumed.

The plant of the Berkeley Brick Company, at Berkeley Heights, N. J., has been sold to the Block Chemical Works, of Newark, and will be converted into a factory for the manufacture of chemicals for use in the war.

The Holly Clay Company has been incorporated to manufacture clay products. The company is capitalized at $100,000, and those interested are William F. O'Keefe, George G. Steiger and E. E. Wright, of Wilmington, Del.

The kiln sheds at the plant of the Kankakee Brick and Tile Company, Kankakee, Ill., were completely destroyed by fire. As this was the only part of the plant not fireproof, the fire was allowed to burn itself out. The loss was almost wholly covered by insurance.

The Washington Brick, Lime and Sewer Pipe Company, of Spokane, Wash., has commenced rebuilding its plant at Dishman, which was recently damaged by fire. Lawrence Spear, manager of the company, says they will rush the work to completion as rapidly as possible, and expects to be filling orders by the first of February. Heretofore, only sewer pipe and partition tile have been made, but changes will be made in the plant to add other products to the output.

The Haeger Brick and Tile Company, Aurora, Ill., recently closed a contract controlling an immense tract of clay land, in which they agree to pay a royalty to the owner of the land of 5 cents per ton, and on and after December, 1918, to pay a minimum royalty on $50,000, 10,000 tons per year. The company is not permitted to use the clay to manufacture any ladle lining brick or fire brick, except for lining their kilns in Dundee, Gilberts or Coal City plants. The company will also pay all taxes and assessments.

The new plant of the Sheffield Tile Company, Sheffield, Ia., is now in the midst of construction. The buildings are of brick and steel throughout. The grounds occupied by this new plant are, not including the pit, 1,000 feet long and 600 feet wide. The main building, including the dryer, is 165 feet wide and 202 feet long, and the part in which the machinery is to be installed will be fifty feet high. There are now ten kilns under construction, and four will be built later. These kilns are thirty feet in diameter and are of the round, downdraft type. A feature of no small importance to the new plant is the large hotel built for the accommodation of the workmen. This is located just south of the building and is built entirely of brick, a fine looking building. In this hotel there are fourteen bedrooms, large enough for two beds each; a large dining room and living room; kitchen and storeroom on the first floor, with baths and conveniences in the basement.

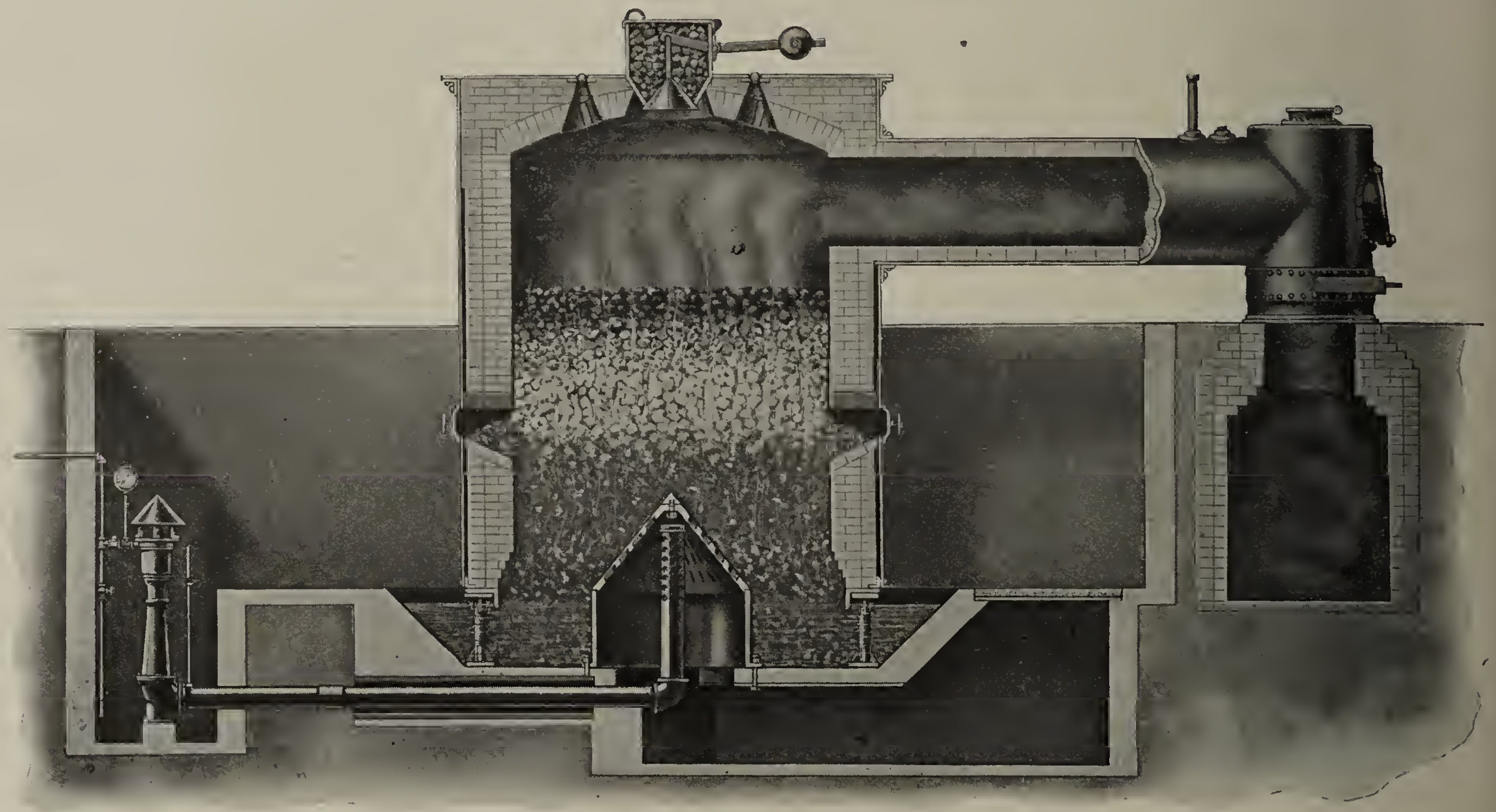
(Continued of Page 572.)

89.8 PER CENT

WITH ONLY 0.4 PER

DEMONSTRATED BY INTER

In Recent Tests Made By



International Producer with Connections to Underground Flue

43 INTERNATIONAL PRODUCERS
INDUSTRY

Far More International Producers Drying and

Coal Getting Scarcer==Save it=

INTERNATIONAL CLAY

DAYTON

Mention The Clay-Worker.

EFFICIENCY

ENT CARBON IN ASH

ATIONAL GAS PRODUCERS

wo Noted Ceramic Professors

A Battery of Producers in a Clay Plant

OLD TO THE CLAYWORKING
HIS YEAR

urning Clays Than All Other Makes Combined

se Producer Gas==Write Today

ACHINERY COMPANY

HIO, U.S.A.

EDITORIAL NOTES AND CLIPPINGS—Continued.

The entire building is heated by steam. Provision will be made for a garden plot for the family which runs this hotel.

Albert and Lincoln Solfisburg, of Aurora, Ill., have retired from the brick and tile business. Their clay has been exhausted.

The office of the Sparta Brick and Tile Company, at Sparta, Wis., was entirely destroyed by fire the latter part of November. The loss is entirely covered by insurance.

Fire, which started in the roof of one of the kilns of the Speeceville Brick Company's plant at Speeceville, Pa., destroyed the roof of two of the kilns before it could be extinguished.

During a terrific wind storm at Sebring, O., early in the month, the temporary frame structure over the continuous kiln which is being erected at the Sebring Pottery Company's plant was blown down.

A. P. Maloney, Philadelphia, Pa., writes that he is making investigations with a view of purchasing clayworking machinery and appliances. He can be addressed at the Manufacturers' Club, Philadelphia.

N. Triplett, one of the pioneer brick manufacturers of Spokane, Wash., died quite suddenly in the office of the physician whom he had gone to consult. He had been engaged in the manufacture of brick at Spokane more than twenty-five years.

J. P. Carter, engineer at the Table Rock Brick and Tile Company, Table Rock, Neb., was badly crushed in the machinery. At first it was thought it would be necessary to amputate his hand, but the attending physician was able to save it.

The Navy Department, Washington, D. C., is inviting proposals to furnish 300 tons of air-floated fire clay, to be delivered at Norfolk, Va. Bidders should request Bureau of Supplies and Accounts, Navy Department, Washington, to send schedules covering this material, mentioning Schedule No. 1613.

Andrew Shephard, for thirty years a brick manufacturer of Swissvale, Pa., died at his home in that city recently. He was eighty-two years old and had not been actively engaged in the business for the last five years. Five sons and one daughter survive.

The Birmingham Clay Products Company, which has an authorized capital stock of $9,250, has filed articles of incorporation. The headquarters are in Birmingham, Ala. The officers are: William B. White, president; John M. Bradley, vice-president, and J. D. Rucker, secretary and treasurer.

S. J. Galvin, for the past three years sales manager for the American Brick and Tile Company, Mason City, Ia., has resigned to become general manager of the Auburn Brick and Tile Company, located at Auburn, Ia. He has acquired a block of stock in the concern and will thus be directly interested in its success and profits.

L. Aulman, manager of the Eagle Iron Works, Des Moines, Ia., calls our attention to an error in the letter of Mr. H. F. Goss, manager and secretary of the Casper Brick and Tile Company, of Casper, Wyo., stating they had purchased two nine-foot Standard Eagle represses. This should have read "two nine-foot Eagle Standard dry pans."

The St. Clair Brick Company's plant at St. Clair is temporarily closed as the result of a fire, which destroyed the kiln shed—probably the largest of its kind in Michigan—also the dry shed, together with 200 cords of four-foot wood, making a total loss of between $10,000 and $12,000. The machinery suffered little damage. The new kiln contained 200,000 brick, which are in good condition. The dry shed contained nearly 100,000 brick, and some of these were chipped and damaged, though most of them can be saved and burned into good brick.

The Veedersburg Brick Company, Veedersburg, Ind., is making arrangements to add drain tile to their output.

The Evans & Howard Fire Brick Company, of St. Louis, Mo., is making a number of improvements, including the erection of an additional kiln.

The Chicago Fire Brick Company, Chicago, Ill., has leased a tract of land comprising close to 1,000 acres at Wellsville, Mo., on which they will erect an immense fire brick plant.

The plant of the Kanawha Brick Company, located at South Ruffner, W. Va., was badly damaged by fire recently. The loss is estimated at $30,000, only partly covered by insurance. The head office of the company is at Charleston, W. Va.

The River Stone and Brick Company, of Uniontown, Pa., has made application for a charter. The company will mine clay and manufacture brick and other clay products. Those interested in the concern are L. Swigart, Frank Kissinger, Harry W. Byrne, J. J. Quertiamont and C. E. Boehler.

Fire, which broke out in the mine of the American Fire Clay Company, near Canfield, O., burned for more than a week before it could be controlled, men fighting it day and night. The fire started near the pumps, but its origin was a mystery. Much damage was done by the fire, the roof of the mine falling in at several points. The company employs about 50 men and much fire clay is shipped to iron and steel points. Some coal is mined, but only a few cars a week are shipped.

Twenty-one contractors and retail tile dealers, present and former members of the Philadelphia, (Pa.) Tile, Mantel and Grate Association, were held under $21,000 joint bail December 12 in the Federal court on a charge of conspiracy to retard trade in violation of the Sherman anti-trust law. The tile men are charged with having violated the law in making agreements with manufacturers throughout the country to sell tile only to members of the association and with the Tile Setters' Union to furnish union labor to no one not affiliated with the organization.

J. D. Fate & Co., Plymouth, O., report that the past season has been the busiest in their history, although for a short time there seemed to be a slackening up of orders and inquiries. This has increased, however, in the last few weeks, and they have booked a number of good orders and are receiving an unusual number of inquiries for this season of the year. Mr. Sykes, secretary and treasurer of the company, is of the opinion that after the coal situation is relieved so that cars will be available for moving brick and building materials generally, there will be considerable building activity as well as road construction next spring.

THE LYONS (FRANCE) FAIR.

Our consul at Lyons, France, J. E. Jones, is making a special appeal for catalogues and representation of one kind and another at the sample fair to be held there March 1, 1918. He has also secured permission from the Lyons Chamber of Commerce to put in an American catalogue exhibit as part of its commercial library. This Lyons fair seems to offer special opportunities to the clayworking machinery people, especially to get labor-saving devices before the French people. Some may find it advantageous to send machines and representatives and make actual demonstration, while surely every machinery man can send in some catalogues and printed matter. Of course, it would be best to have this matter in French, but if that is not practical, some worth while results should be had from sending catalogues and circulars in English. Those French folks at home are learning a whole lot about us these days, and learning to read our language as well as recognize our flag, all of which makes it a mighty good time for the machinery folks to get into the game with their offerings.

Oak Park Lane, Columbus, Ohio. Filling Joints of brick pavement with Barrett's Paving Pitch.

Barrett's PAVING PITCH

Paving Pointers

IT may be possible to lay a brick pavement with cement filler that will always be a credit to its builder, but even the best municipal engineers are constantly getting into trouble with that combination. Cement filler attempts the almost impossible feat of restraining the brick from expanding in hot weather.

Shrewdly planned lateral and traverse expansion-joints at the proper intervals and angles may serve to prevent the expansion of the pavement from thrusting the curbing out of line, or from causing trouble at manholes, railway tracks, etc. The placing of such expansion-joints, however, is far from an exact science; moreover, the joints themselves are sources of trouble, for they must necessarily be wide, inasmuch as they must account for the expansion of a considerable area of bricks.

In cold weather such expansion-joints are so wide that they form a groove across the pavement, exposing the edges of the brick, which crumble under traffic.

If the foundation settles ever so slightly, the brick monolith does not settle with it, but remains suspended in the air. Hollow sounds when vehicles pass over such areas betray the existence of the settling, but there is no help for it, and the engineer can only wait helplessly until some day the insufficiently supported brick breaks down under a heavy load and makes a wide, ugly crack. If there is a curve in the road the expansion problem is particularly tricky, and frequently the most elaborate management of expansion-joints will not suffice.

The simplest escape from all these difficulties is to abandon the use of cement filler altogether and use Paving Pitch. *Every joint is then an expansion-joint.* There are no stresses or strains at any point. When the pavement is completed the engineer knows that it will play no tricks on him, but will proceed to give him good service for twenty or thirty years without any further care or expense.

The best paving pitch is Barrett's Paving Pitch. Look for the label on the barrels.

Booklets free on request. Address our nearest office.

The Barrett Company

New York Chicago Philadelphia Boston St. Louis
Cleveland Cincinnati Pittsburgh Detroit Birmingham
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CINCINNATI BRICK AND BUILDING SITUATION.

THERE WILL be a rather inauspicious end to the building industry here at the close of the present year. Conditions during the past few months have been very backward and the demand for all kinds of clay products, as well as all other building materials, has been gradually falling back, so that the industry has suffered a shock. There is little now that can be counted on for the near future, and the beginning of the year will not be conducive to any decided change for the better, judging from the present aspect.

There has been one gratifying attitude taken here, however, and one that proves the state of mind of the building interests with regard to the future and that indicates the attitude that will be taken whenever there is a possible sign for betterment. As a preliminary of this condition, there was an entertainment and banquet given by the Bricklayers' Association on November 28 at the Builders' Exchange here in connection with an effort that is being made to lower the cost of building and in other respects to give more stability to the industry as a whole. At this meeting addresses were made by H. B. Yergason, secretary of the Exchange, and by David Burnet, business manager of the association. This should tend to arouse a wider interest in the future labors of the members.

A general meeting of the Builders and Traders' Exchange was held on December 6 to consider further the idea of taking action with regard to the building situation here. In connection with this a discussion of the Code of Ethical Practice, which has been proposed by the National Committee, was taken up. A lunch and motion picture exhibit was a part of the evening's entertainment.

On December 17 there will be held at the Builders' Exchange a general meeting of the various organizations of the exchange to outline plans for the betterment of existing conditions, as well as to consider means of improving the local conditions. At a meeting of the board of directors of the organization, a short time ago, a plan was outlined that gives an idea of the scope of the subject and what will be done. At this gathering there will be perfected an organization to take care of the details.

In discussing this matter and its significance, as applied to the brick and general building industry, Mr. J. Milton Blair, a member of the Exchange, stated that the following program was to be carried out:

To call upon the Institute of Architects for a report upon the demand for construction in connection with the Real Estate Exchange.

Obtain the supplies and prices of building materials, through organizations of lumber, brick, cement, fuel and other materials which enter into the erection of buildings.

Obtain the supplies and price of mortgage money from bankers and building associations. Secure data on the transportation facilities from railroads and steamboat owners.

Secure the construction of building laws and the building code as affecting the amount of building from the City Building Inspector's office.

Obtain information from labor organizations as to the number of wage earners in the building trades and prices demanded.

There has been a material decline in the building industry here, and, in the opinion of the above authority the present condition has never been equaled since the period of the Civil War and immediately thereafter.

Tentative plans are being discussed with regard to the building of a large seven-story terminal building, to be erected here, that will cost, with the ground, $2,200,000. The Cincinnati Terminal Warehouse Co. has the matter under consideration. Options have been obtained on land here at Central avenue and Smith street, from Front to Augusta street. Alfred M. Allen & Co. have made plans for the building and the trackage. The building will be so erected as to accommodate fifty freight cars at one time. It is said the contract will be let about January 1.

The Randle Machinery Co. is erecting an addition to its plant on Spring Grove avenue and Township street. It is a one-story brick structure, 50 by 60 feet, and will be used as a boiler house by the company. It will cost $3,000.

A large school building is to be erected at Sinton Park to cost $325,000. It will contain about thirty-five rooms, including dining room, lunch room and model flat. It will be of brick construction, 300 by 145 feet. Garber & Woodward are the architects. A similar building is to be erected at Eighth and John streets, and a bungalow school building is to be erected at Eighth and Donnersberger streets. The plans for the new Hoffman school have been completed by Architect Samuel Hannaford & Sons and work is to be started before long.

The brick plants here are all about closed down and the winter vacation has set in for good. The demand not being very brisk, there has been no incentive to operate any longer, and the plants that are equipped for winter work do not find it profitable this year to continue.

The face brick man and others, who cater to the building trade, say there has been a lessened demand of late and that the future does not offer anything of an encouraging nature at this time. In some lines, for instance fire clay and fire brick, there has been a notable demand. Sewer pipe might be considered as a little more active, with fair prospects, but other lines are very inactive. Some of the larger jobs are being held up, seemingly on account of the unsettled conditions and the difficulty in moving materials. The latter question has become more serious of late and the outlook is not very promising of a betterment at this time.

The Anders Shale Brick Co. has closed down its plant for the winter, as business is not very active now.

There has been a good demand with the Cincinnati Clay Co. for fire brick and a fair call for sewer pipe, though the former commodity has been the leading one for some time. Mr. Kopp is very well pleased with the situation, taking into consideration the general conditions now.

The National Sales Co. notes that the demand for fire clay and fire brick has been very large, in fact, the question is not to sell these commodities, but to get the supplies. Other clay lines with the company have been moderately good, but not as brisk as they might be. The question of getting what is wanted is the real factor now, after the orders are received, at least for some lines.

Conditions with the Purcell-Grand Co. are slow and Mr. Purcell states that the near future does not offer very much in the way of prospects that look flattering. Face brick are very lacking in activity now.

The Cincinnati Clay Products Co. states that there has been less life to the trade of late than formerly and they do not expect much for the next few months.

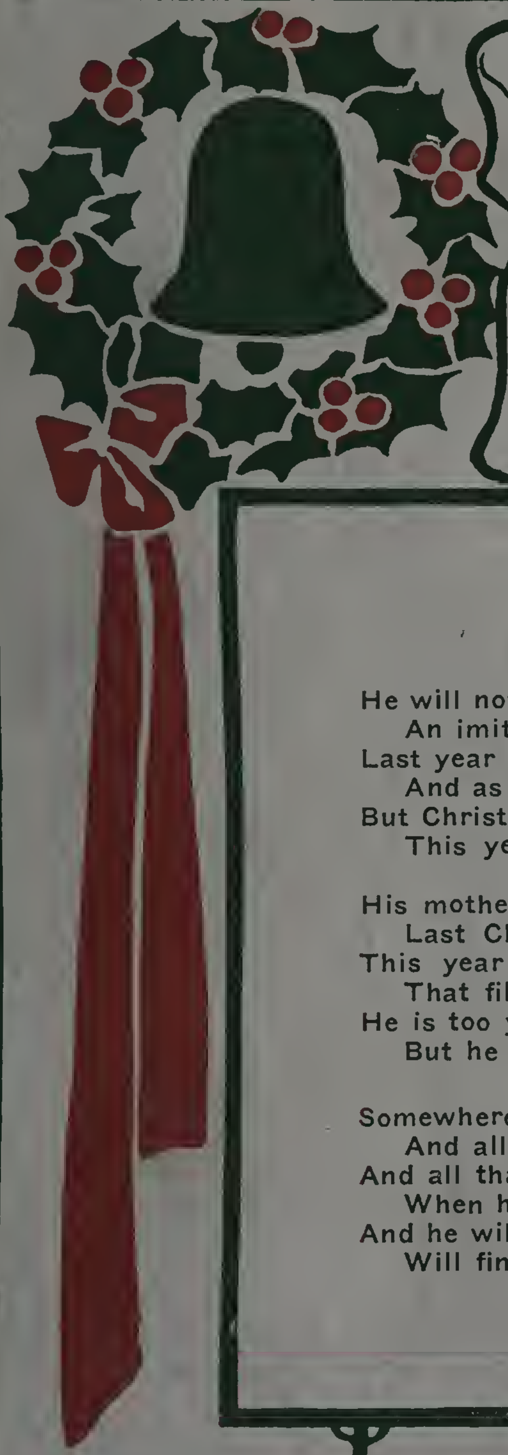
The Moores-Coney Co., Mr. Jackson, finds the brick demand to be very dull, with the exception of what they have in the way of orders for war material plants. This helps to get both railroad service and orders delivered.

Business with the Cincinnati Sewer Pipe Co. has been fair, but not rushing, with the indications at this time uncertain.

CINCY.

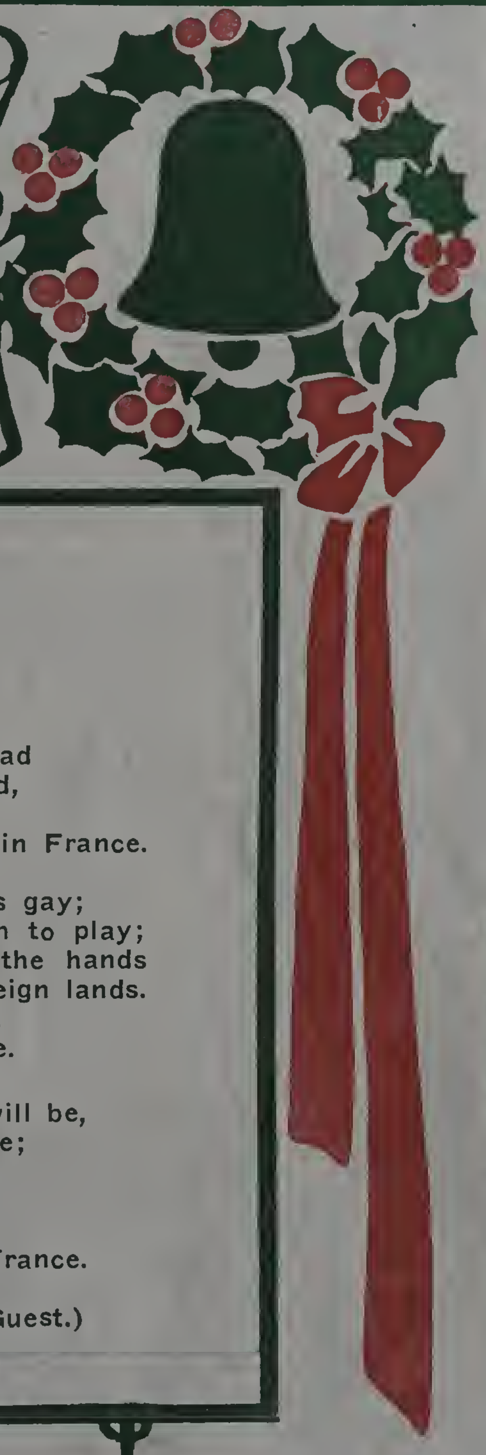
Some cheerful news is found in reports indicating that building operations this fall have only been about 35 percent above those of last fall instead of cut in half as we were led to believe.

THE CLAY-WORKER



Christmas

1917



HIS SANTA CLAUS

He will not come to him this year with all his old-time joy,
  An imitation Santa Claus must serve his little boy;
Last year he heard the reindeers paw the roof above his head
  And as he dreamed the kindly saint tip-toed about his bed,
But Christmas Eve he will not come by any happy chance,
  This year his kindly Santa Claus must guard a trench in France.

His mother bravely tries to smile; last Christmas Eve was gay;
  Last Christmas morn his daddy rose at dawn with him to play;
This year he'll hang his stocking by the chimney, but the hands
  That filled it with the joys he craved, now serve in foreign lands.
He is too young to understand his mother's troubled glance,
  But he that was his Santa Claus is in a trench in France.

Somewhere in France this Christmas Eve a soldier brave will be,
  And all that night in fancy he will trim a Christmas tree;
And all that night he'll live again the joys that once he had
  When he was good St. Nicholas unto a certain lad.
And he will wonder if his boy, by any sad mischance,
  Will find his stocking empty just because he serves in France.

—(Copyright, 1917, by Edgar A. Guest.)

T·A·RANDALL·&·CO
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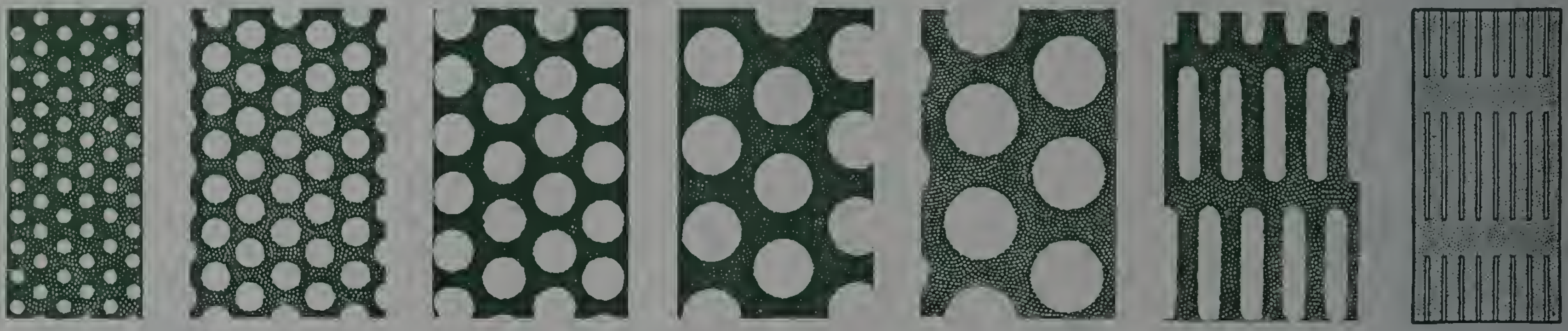
FOR CLAY, SHALE, SAND, GRAVEL, STONE AND CEMENT.

Anything You Want in Perforated Metal.



Perhaps you may be interested in some of the sizes shown above; they are a few of the many that we make.

We have sizes suitable for DRY PAN SCREENS, CAR DECKS, CONVEYORS, Etc.

Tell us of your needs that we may send you samples.

The Harrington & King Perforating Co.

NEW YORK OFFICE,
No. 114 Liberty St.

No. 624 North Union Ave.
CHICAGO, ILL., U. S. A.

"No Wheelers Wanted" at this Plant for Loading Cars.

The rush season has no terrors for the Cuyahoga Brick & Shale Co. (Cleveland, Ohio.) The photograph at the left shows how they have beaten the "wheeling" game with a system of Mathews Gravity Brick Conveyers. A steady stream of brick flows steadily from kilns into cars in any kind of weather and with any kind of help.

This method enables you to roll your brick by gravity on a slight down grade, with no waste of time or labor to pay for, no damaged brick to discard, no expensive pay roll to take care of, and no fear of not being able to get your brick loaded promptly at all times.

Many large brick manufacturers have become users of the Mathews system this year. Hundreds of others have employed the gravity method for many years and could not be induced to discard it for any other method. We can supply prospective purchasers with plenty of references if desired.

Made entirely of steel, equipped with ball bearing rollers, assembled in portable units fitted with universal couplings. Curves of any desired angle can be supplied to deliver the brick to any required destination. Will last for years with very little upkeep expense.

Our representative will visit your plant, lay out a system to fit your requirements, tell you what it will cost, and take your order, all without extra cost. This service will not obligate you to buy if our proposition does not prove attractive. We can send you literature, but valuable time will be saved by requesting representative to call.

MATHEWS GRAVITY CARRIER CO.

Branch Factories:
TORONTO, ONT.
LONDON, ENG.

ELLWOOD CITY, PA.

RODGERS

EVERYBODY, EVERYWHERE

NOW

"COUNTS THE COST" AS NEVER BEFORE

"CUTTING THE COST"

is **daily** becoming more necessary. As in the past, we continue to originate new methods of **reducing the cost of production** of clay products.

We "preached" the practice of

CONSERVATION

years before its practice became **practically compulsory.**

WE MAKE "CONSERVATION" COUNT

L. E. RODGERS ENGINEERING CO.

Waste Heat Dryer Specialists
Clay Products Engineers

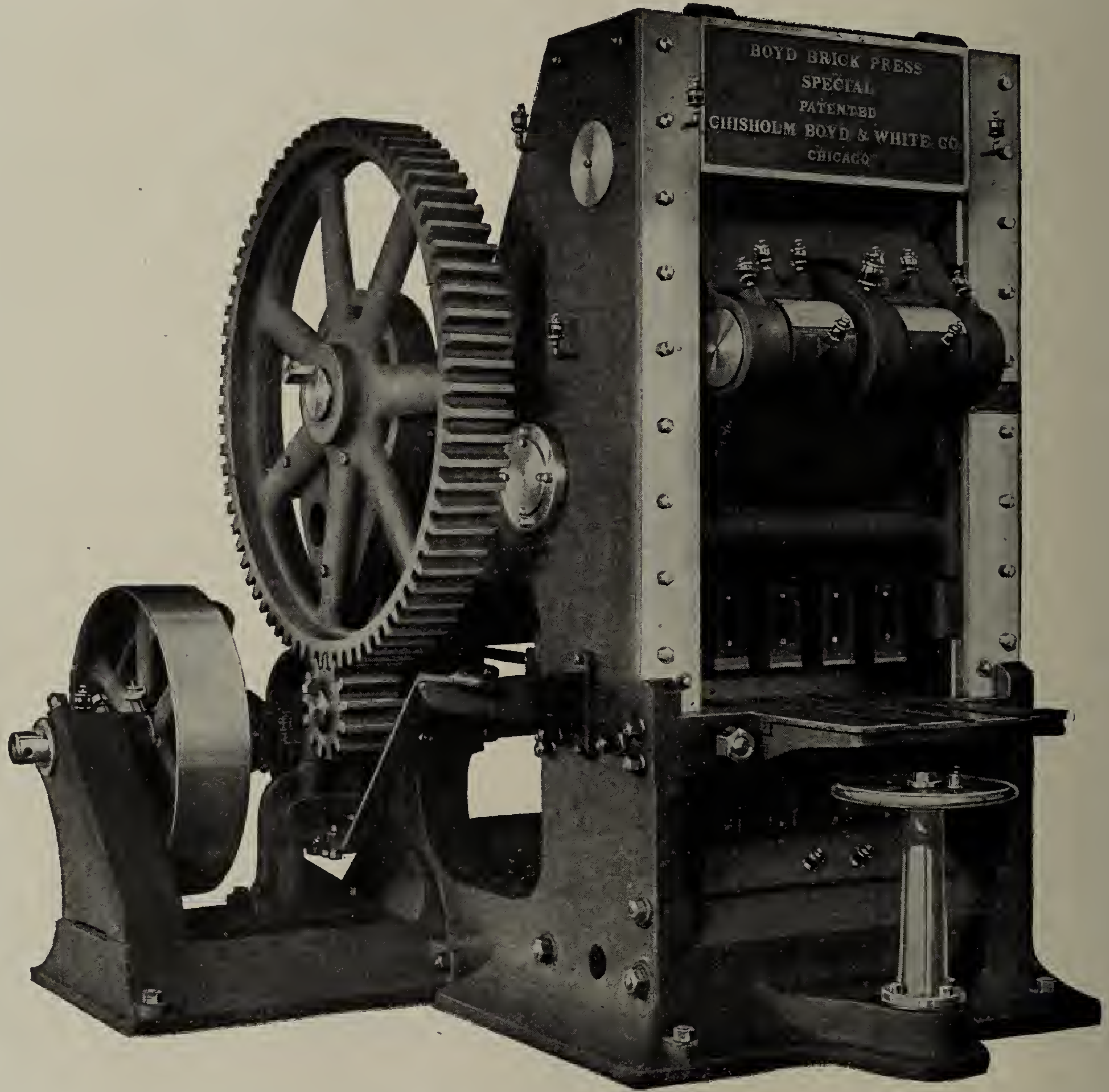
Largest Manufacturers of Brick Drying Equipment in the United States.

30 North LaSalle Street ∴ ∴ CHICAGO

RODGERS

The Boyd Brick Press

"Built Up to a Standard—Not Down to a Price"



ITS OWN BEST SALESMAN

FIRE BRICK PRODUCED AT LOWER COST

For more than 20 years the BOYD BRICK PRESS has been in use for making FIRE BRICK and shapes, and today is used by many of the largest and most successful fire brick manufacturers in the country.

Chisholm, Boyd & White Company
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Arbuckle & Co.
Bonnot Co., The
H. Brewer & Co.
Carnell, Geo.
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Wallace Mfg. Co.

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Roessler-Hasslacher Chem. Co.

Bearings, Roller.

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Manufacturers Equipment Co.

Belt Conveyors.

American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
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Caldwell & Sons Co., H. W.
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Brewer & Co., H.
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Wallace Mfg. Co.

Brick Machines (Soft Mud).

American Clay Machinery Co.
Anderson Fdy. & Mch. Works.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Potts & Co., The C. A.

Brick Machines (Stiff Mud).

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Arbuckle & Co.
Bonnot Co., The
Brewer & Co., The
Chambers Bros. Co.
Fate & Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Stevenson Co., The
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Brick Machines (Dry Press).

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Chisholm, Boyd & White Co.
Chicago Brick Machinery Co.
International Clay Mach. Co.

Brick Recutter.

International Clay Mach. Co.

Brick Setting Machinery.

American Clay Machinery Co.

Buffing Machinery.

American Clay Machinery Co.

Burning and Drying Systems.

American Clay Machinery Co.
American Blower Co.
Boss, John C.
International Clay Mach. Co.
Koch, J. J.
Manufacturers Equipment Co.
Richardson-Lovejoy Eng. Co.
Rodgers Engineering Co., L. E.
Standard Dry Kiln Co.
Trautwein Drying & Engr. Co.
Yates, Alfred.

Cars.

(See Dryer and Dumping Cars.)

Castings.

American Clay Machinery Co.
Arbuckle & Co.
Caldwell & Sons Co., H. W.
Chambers Bros. Co.
Fate Co., The J. D.
Frost Mfg. Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Ceramic Engineers.

Hoehne, Richard B.
Koch, J. J.
Lovejoy, Ellis.
Richardson, W. D.
Trautwein Dryer & Engr. Co.

Circuit Breaker.

Westinghouse Elec. & Mfg. Co.

Clay Crushers and Pulverizers.

American Clay Machinery Co.
American Pulverizer Co.
Arbuckle & Co.
Brewer & Co., H.
Carnell, Geo.
Chambers Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Phillips & McLaren Co.
Potts & Co., C. & A.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Clay Dryers.

American Process Co.
Trautwein Dryer & Engr. Co.

Clay Feeders and Mixers.

American Clay Machinery Co.
Arbuckle & Co.
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Clay Gatherers.

(See Scrapers.)

Clay Steamers.

American Clay Machinery Co.
International Clay Mach. Co.

Clay Technologists.

American Clay Machinery Co.
Fate Co., The J. D.
Hoehne, Richard B.
Koch, J. J.
Richardson-Lovejoy Engr. Co.

Clutches.

(See Supplies.)

Coloring Materials.

Chattanooga Paint Co.
Ricketson Mineral Paint Co.
Roessler-Hasslacher Chem. Co.
Williams & Co., C. K.

Cones.

Orton, Edward, Jr.

Consulting Engineers.

Hoehne, Richard B.
Lovejoy, Ellis.
Richardson, W. D.
Trautwein Dryer & Engr. Co.

Conveying Machinery.

American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Carnell, Geo.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Louisville Machine Co.
International Clay Mach. Co.
Leary Mfg. Co., W. J.
Manufacturers Equipment Co.
Mathews Gravity Carrier Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.

Continuous Kilns.

American Clay Machinery Co.
Hoehne, Richard B., & Co.
International Clay Mach. Co.

Contracting Engineers.

Koch, J. J.
Lovejoy, Ellis.
Manufacturers Equipment Co.
Richardson, W. D.
Smith Co., Claude.

Couplings.

(See Supplies.)

Cutting Tables (Brick & Tile).

American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Cranes.

Ball Engine Co.

Cutting Wires.

American Clay Machinery Co.
Arbuckle & Co.
Brewer & Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.

Dampers.

(See Supplies.)

Dies.

Arbuckle & Co.
(See Supplies.)

Disintegrators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Draft Gauges.

Brown Instrument Co.
Ceramic Supply & Con. Co.
Engelhard, Charles.
Thwing Instrument Co.

Drag Line Excavators.

Ball Engine Co.

Drain Tile Machinery.

(See Brick & Tile Machinery.)

Drums, Hoisting and Winding.

(See Supplies.)

Dryers.

American Clay Machinery Co.
American Process Co.
Boss Co., John C.
Chambers Bros. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Philadelphia Textile Mach. Co.
Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Trautwein Dryer & Engr. Co.

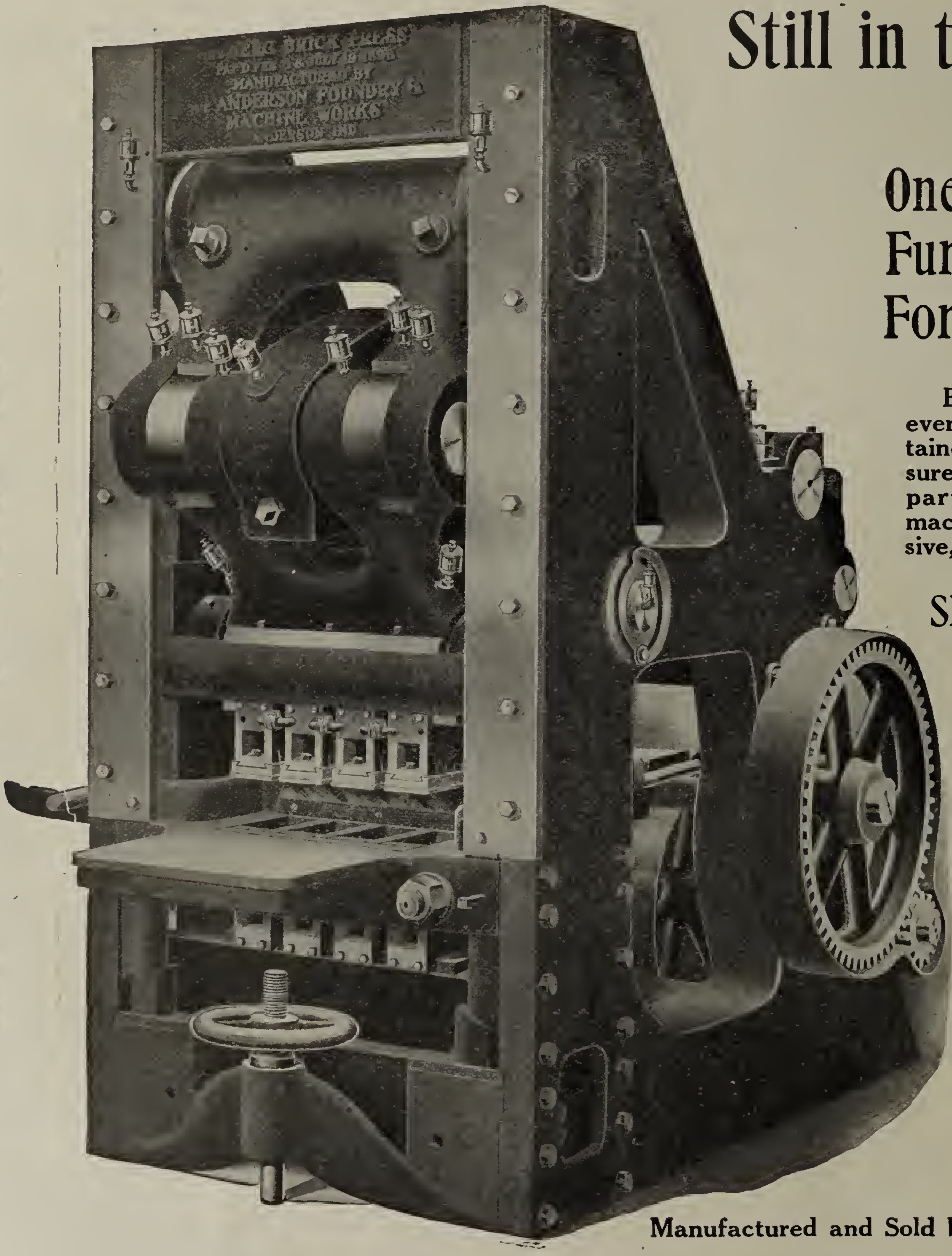
Dryer Cars.

American Clay Machinery Co.
Arbuckle & Co.
Atlas Car & Mfg. Co.
Bonnot Co., The
Chambers Bros. Co.

(Continued on page 509.)

NEW MODEL BERG BRICK PRESS

WE MANUFACTURE AND INSTALL COMPLETE PLANTS UNDER GUARANTEE FOR THE MANUFACTURE OF SAND-LIME BRICK.



Still in the Lead

and

One Step Further Forward.

Even stronger than ever, and all self-contained. Greater pressure and fewer working parts than any other machine. Simple. massive, compact and

SHIPPED IN ONE PIECE.

All Machines Are Equipped With

CUT GEARING.

Manufactured and Sold by

THE ANDERSON FOUNDRY & MACHINE WORKS

Manufacturers of Soft Mud Brick and Drain Tile Machinery

ANDERSON, IND.

Buyers Ready Reference List—Continued.

Chase Fdy. & Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
National Dry Kiln Co.
Potts & Co., C. & A.
Rodgers Engr. Co., The L. E.
Standard Dry Kiln Co., The
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Trautwein Dryer & Engr. Co.

Dry and Wet Pans.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
Eagle Iron Works.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.
Phillips & McLaren Co.
Taplin-Rice-Clerkin Co.

Dump and Clay Cars.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.

Electric Instruments.

Brown Instrument Co., The
Thwing Instrument Co.
Westinghouse Elec. & Mfg. Co.

Electric Shovels.

Ball Engine Co.
Thew Automatic Shovel Co.

Electrical Furnaces.

Brown Instrument Co., The
Richardson-Lovejoy Engr. Co.

Electrical Locomotives.

Atlas Car & Mfg. Co.
Arbuckle & Co.
Westinghouse Elec. & Mfg. Co.

Electrical Supplies.

American Clay Machinery Co.
International Clay Mach. Co.
Westinghouse Elec. & Mfg. Co.

Elevating Equipment.

(See Conveyors.)

Engines.

American Clay Machinery Co.
Arbuckle & Co.
Ball Engine Co.
Carnell, Geo.
Chambers Bros. Co.
Frost Mfg. Co.

Engineers.

American Clay Machinery Co.
Lovejoy, Ellis.
Manufacturers Equipment Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Excavating Machinery.

Ball Engine Co.

Fans.

American Clay Machinery Co.
Manufacturers Equipment Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Feed Water Heaters.

American Blower Co.
American Clay Machinery Co.
Arbuckle & Co.
Frost Mfg. Co.
Standard Dry Kiln Co.

Filler (Paving).

Barrett Mfg. Co.

Filter Presses.

American Clay Machinery Co.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.

Fire Brick and Fire Clay.

Parker-Russell M. & M. Co.

Flower Pot Machinery.

Baird Machinery & Mfg. Co.
Rockwood Mfg. Co., The
Taplin-Rice-Clerkin Co.

Friction Clutch Pulleys.

(See Supplies.)

Furnaces.

Brown Instrument Co., The
International Clay Mach. Co.
Smith Co., Claude.

Gas Fire Continuous Kilns.

International Clay Mach. Co.
Manufacturers Equipment Co.

Gears.

(See Supplies.)

Generators.

Westinghouse Elec. & Mfg. Co.

Grading Machinery.

Ball Engine Co.

Granulators.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Chambers Bros. Co.
Chicago Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Grates.

American Clay Machinery Co.
Arbuckle & Co.
Manufacturers Equipment Co.
Marion Mach., Fdy. & Sup. Co.
Potts & Co., C. & A.
Smith Co., Claude.

Gravity Carriers.

Mathews Gravity Carrier Co.
Taplin-Rice-Clerkin Co.

Gravity Haulage.

American Clay Machinery Co.

Hand-Power Presses.

American Clay Machinery Co.
Carnell, Geo.
Fate Co., The J. D.
International Clay Mach. Co.
Lakewood Engineering Co.

Hand Winch.

(See Supplies.)

Hangers.

(See Supplies.)

Hoists.

(See Supplies.)

Hollow Brick Machinery.

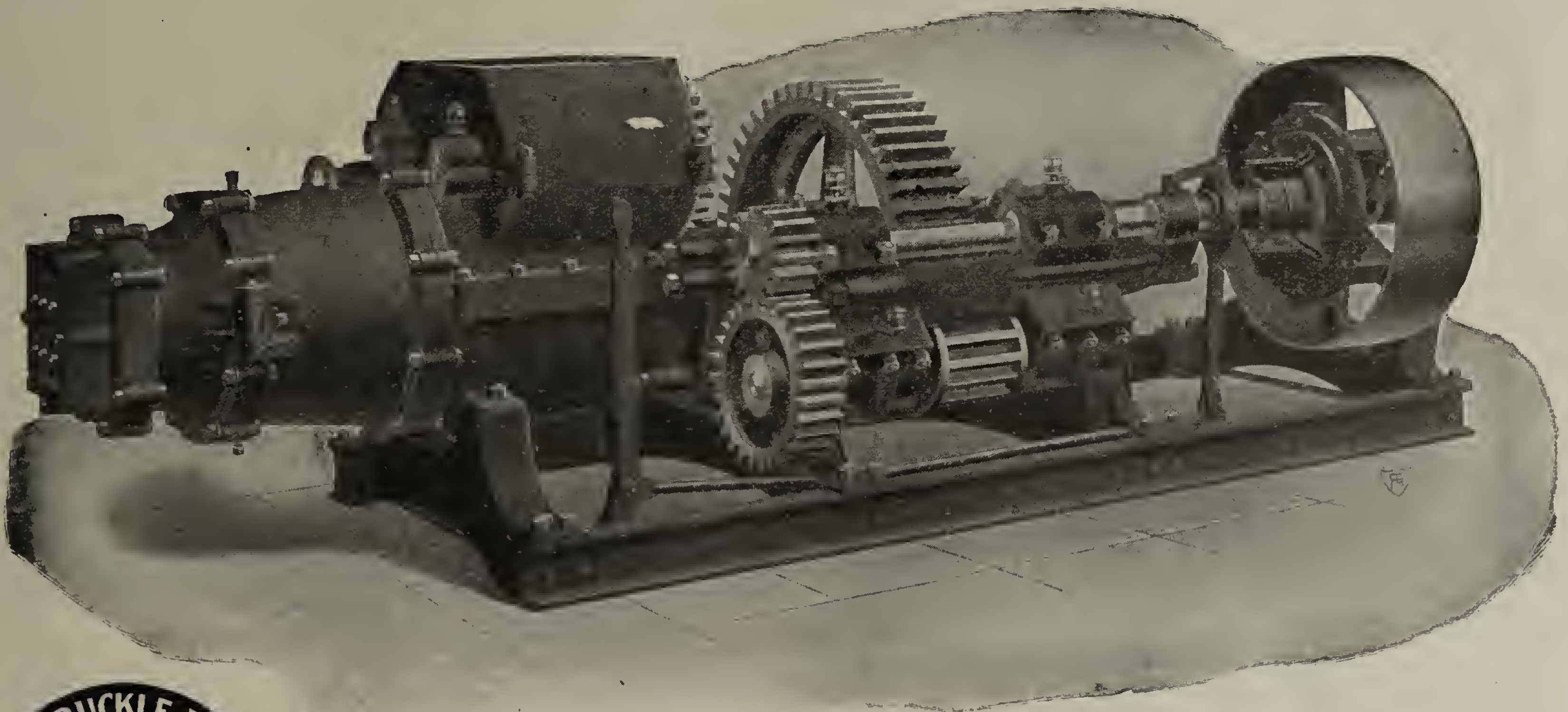
American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Brewer Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Insurance.

Mantel, Tile and Grate Monthly.

(Continued on page 510.)

If you want real service—USE THIS MACHINE. Hundreds of satisfied users. Let us tell you about this.



ARBUCKLE & CO. BUILT FOR SERVICE CLAY WORKING MACHINERY

8-E AUGER MACHINE

ARBUCKLE & COMPANY
Rushville, Ind., U.S.A.
WRITE FOR CATALOG

Buyers Ready Reference List—Continued.

Jacks.

(See Supplies.)

Kilns.

American Clay Machinery Co.
Boss Co., John C.
Hoehne, Richard B., & Co.
International Clay Mach. Co.
Klose, A.
Manufacturers Equipment Co.
Richardson, W. D.
Smith Co., Claude.
Yates, Alfred.

Kilns, Doors, Castings and Frames.

(See Supplies.)

Kiln Bands.

Caldwell, W. E. & Co.
Smith Co., Claude.

Knives.

(See Supplies.)

Locomotives.

Fate Co., The J. D.

Manganese.

(See Coloring Materials.)

Mechanical Draft.

American Clay Machinery Co.
Boss, J. C.
Manufacturers Equipment Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Mineral Paint.

(See Coloring Materials.)

Molds (Brick).

American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Mentz, George B.
Potts & Co., C. & A.

Mold Sanders.

American Clay Machinery Co.
Carnell, Geo.
Eastern Brick Machinery Co.
International Clay Mach. Co.
Potts & Co., C. & A.
Wallace Mfg. Co.

Mortar Colors.

(See Coloring Materials.)

Motors.

Westinghouse Elec. & Mfg. Co.

Motor Trucks.

Fate Co., The J. D.

Oil Burners.

Schurs Oil Burner Co.

Paints.

(See Coloring Materials.)

Pallets.

Lakewood Engineering Co.
Ohio Galvanizing & Mfg. Co.

Pans (Dry and Wet).

(See Dry and Wet Pans.)

Paving Brick or Block.

(See Brick.)

Perforated Sheet Metal.

Caldwell & Sons, H. W.
Harrington & King Perf. Co.

Pitch (Paving).

Barrett Mfg. Co.

Plows.

(See Scrapers.)

Portable Track.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.

Pottery Machinery.

American Clay Machinery Co.
Baird Machinery & Mfg. Co.
Fate Co., The J. D.
International Clay Mach. Co.
Rockwood Mfg. Co.
Taplin-Rice-Clerkin Co.

Powder.

Dupont, E. I. & DeNemours Co.

Power Plant Equipment.

American Clay Machinery Co.
Arbuckle & Co.
Rodgers Engr. Co., The L. E.
Trautwein Dryer & Engr. Co.

Presses.

(See Brick Machines, also Sewer Pipe Machinery, also Roofing Tile Machinery.)

Pug Mills.

American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Carnell, Geo.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Steele & Sons, J. C.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Pulleys.

(See Supplies.)

Pulverizers.

Arbuckle & Co.
American Clay Machinery Co.
American Pulverizer Co.
Fate Co., The J. D.
Manufacturers Equipment Co.
Taplin-Rice-Clerkin Co.

Pumps.

Potts & Co., C. & A.

Pyrometers.

Brown Instrument Co.
Engelhard, Charles.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co., The

Rails and Railway Equipment.

American Clay Machinery Co.
Atlas Car & Mfg. Co.
Ball Engine Co.
Fate Co., The J. D.
Lakewood Engineering Co.

Rattlers (Paving Brick).

American Clay Machinery Co.
Freese & Co., E. M.
Phillips & McLaren Co.

Represses.

American Clay Machinery Co.
Arbuckle & Co.
Bonnot Co., The
Carnell, Geo.
Chambers Bros. Co.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Lakewood Engineering Co.
Taplin-Rice-Clerkin Co.

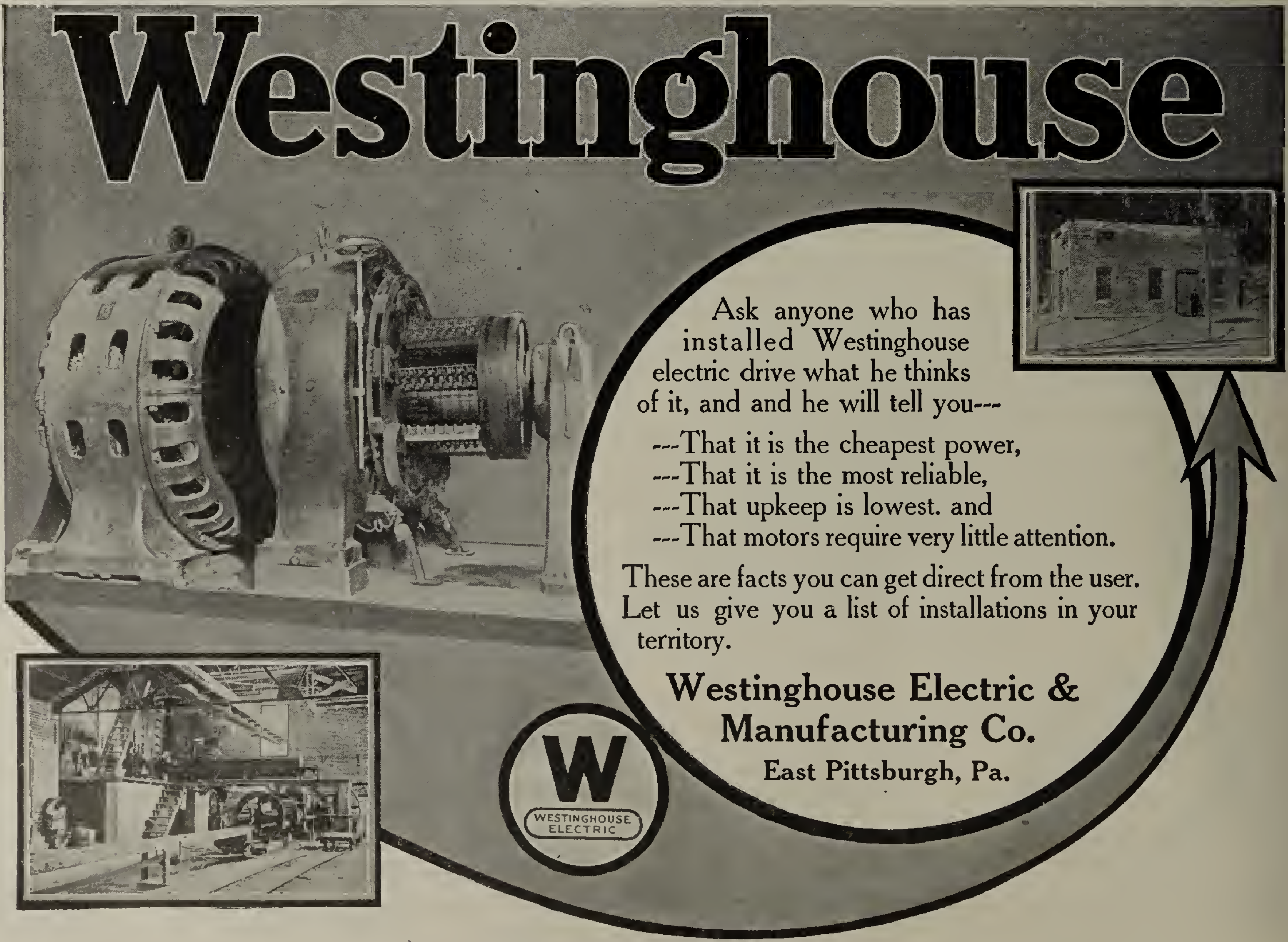
Revolution Indicators.

Brown Instrument Co.
Engelhard, Charles

Revolving Steam Shovels.

American Clay Machinery Co.
Ball Engine Co., The
Thew Automatic Shovel Co.

(Continued on page 512.)



Westinghouse

Ask anyone who has installed Westinghouse electric drive what he thinks of it, and and he will tell you---

---That it is the cheapest power,
---That it is the most reliable,
---That upkeep is lowest. and
---That motors require very little attention.

These are facts you can get direct from the user. Let us give you a list of installations in your territory.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.

SAVE YOUR COAL, DO YOUR BIT
and CUT YOUR DRYING COSTS

TRAUTWEIN
WASTE HEAT DRYERS
DO

"After building your dryer it dried our ware in such satisfactory manner that we forgot we had a dryer."

This plant takes the waste heat from their

UP DRAFT KILNS

By the Trautwein Method and is

SAVING $25.00 PER DAY

in fuel alone.

OUR WASTE HEAT DRYERS ARE THE MOST ECONOMICAL DRYERS IN USE

Trautwein
DRYERS

Trautwein Dryer & Engineering Co.
Foremost Drying Engineers
and
Manufacturers of Drying Equipment
417 South Dearborn St. CHICAGO, U. S. A.

Buyers Ready Reference List—Continued.

Road Graders.
Ball Engine Co.

Rock Crushers.
American Clay Machinery Co.
American Pulverizer Co.
Manufacturers Equipment Co.
Phillips & McLaren Co.

Roofing Tile Machinery.
American Clay Machinery Co.
Fate Co., The J. D.
International Clay Mach. Co.
Taplin-Rice-Clerkin Co.

Rope.
(See Supplies.)

Rotary Dryers.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Fate Co., The J. D.
International Clay Mach. Co.
Potts & Co., C. & A.

Sand Dryer and Sand Sieves.
American Clay Machinery Co.

Sand Lime Brick Machinery.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Ceramic Supply & Con. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White Co.
International Clay Mach. Co.
Lakewood Engineering Co.

School of Ceramics.
Illinois University.
Iowa State College.
New Jersey State School.
New York State School.
Ohio State University.

Scrapers, Plows and Clay Gatherers.
Eagle Iron Works.

Screens.
American Clay Machinery Co.
Arbuckle & Co.
Brewer & Co., H.
Bonnot Co., The
Carnell, Geo.
Chambers Bros. Co.
Dunlap Mfg. Co.
Fate Co., The J. D.
Freese & Co., E. M.
Harrington & King Perf. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Manufacturers Equipment Co.
Taplin-Rice-Clerkin Co.

Sewer Digging Machines.
Ball Engine Co.

Sewer Pipe Machinery.
American Clay Machinery Co.
Brewer & Co., H.
Taplin-Rice-Clerkin Co.

Shale Planers.
Arbuckle & Co.

Steam Gauges.
(See Supplies.)

Steam Shovels.
American Clay Machinery Co.
Ball Engine Co.
Thew Automatic Shovel Co.

Steam Specialties.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.
Trautwein Dryer & Engr. Co.

Steam Traps.
American Clay Machinery Co.
Frost Mfg. Co.
Standard Dry Kiln Co.
Trautwein Dryer & Engr. Co.

Steel Pallets.
Ohio Galvanizing Co.
Lakewood Engineering Co.

Supplies.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Atlas Car & Mfg. Co.
Arbuckle & Co.
Bonnot Co., The
Brewer & Co., H.
Caldwell & Sons Co., H. W.
Caldwell, W. E., & Co.
Carnell, Geo.
Chambers Bros. Co.
Chase Fdy. & Mfg. Co.
Chicago Brick Machinery Co.
Chisholm, Boyd & White.
Eastern Brick Machinery Co.
Fate Co., The J. D.
Freese & Co., E. M.
Frost Mfg. Co.
International Clay Mach. Co.
Lakewood Engineering Co.
Louisville Machine Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Steele & Sons.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.

Switches.
American Clay Machinery Co.
Atlas Car & Mfg. Co.
Lakewood Engineering Co.

Tanks and Towers.
Caldwell, W. E., & Co.

Tempering Wheels.
Carnell, Geo.
International Clay Mach. Co.

Thermometers.
Brown Instrument Co.
Engelhard, Charles.
Rodgers Engr. Co., The L. E.
Thwing Instrument Co.

Tile Machines.
American Clay Machinery Co.
Anderson Fdy. & Mach. Works.
Arbuckle & Co.
Bonnot Co., H.
Brewer Co., H.
Fate Co., The J. D.
Freese & Co., E. M.
International Clay Mach. Co.
Manufacturers Equipment Co.
Potts & Co., C. & A.
Taplin-Rice-Clerkin Co.
Wallace Mfg. Co.
Wellington Machine Co.

Time Recorders.
Brown Instrument Co.
Engelhard, Charles.
Thwing Instrument Co.

Tracks and Switches.
(See Rails.)

Transfer Cars and Turn Tables.
(See Supplies.)

Trench Machines.
Ball Engine Co.

Turn Tables.
American Clay Machinery Co.
Fate Co., The J. D.

Unloading Device for Pans.
American Clay Machinery Co.
Frost Mfg. Co.
International Clay Mach. Co.
Manufacturers Equipment Co.

Voltmeters.
Brown Instrument Co.
Engelhard, Charles.
Westinghouse Elec. & Mfg. Co.

Wattmeters.
Westinghouse Elec. & Mfg. Co.

Wheels and Axles.
(See Supplies.)

Wheelbarrows.
(See Barrows.)

Wet Pans.
(See Pans.)

Wire.
(See Cutting Wire.)

ELWOOD PRESS

BUILT FOR HEAVY DUTY.
ALWAYS MAKES GOOD.

WE ALSO HANDLE EVERYTHING
USED ON A BRICKYARD.

CHICAGO BRICK MACHINERY CO.

Sold Also by
MANUFACTURERS EQUIPMENT CO.
Dayton, Ohio.

20 W. Jackson Blvd., Chicago

Erie Revolving Shovels

"The most economical shovel that I ever ran!"

"During the year and a half that I have run the Erie it has not cost $2.00 for repairs. Nor has there been a ten-minute delay due to the fault of the shovel.

"We have been getting out 360 cubic yards every day of the toughest blue clay that I have ever dug for brick. I believe this Erie Shovel could get out material for 100,000 brick, if we could use that much."—A. L. Darrow, operator of the Number 1 Shovel at the Duffney Brick Company's plant, Mechanicsville, N. Y.

And here is what the operator of the Duffney's Number 2 Shovel says: "Have been operating the Number 2 Erie for 14 months, and have not had a single delay due to the shovel. I've been in the Steam Shovel business for the past 12 years, and the Erie is the most up-to-date and complete shovel on the market today."—H. C. McLenithan.

And here's what the President of the Duffney Brick Company says: "We are highly pleased with the working of our Erie Shovels. Our Number 1 Erie more than paid for itself the first year."—J. M. Purcell.

It's a pretty hard proposition to say who are the strongest boosters for Erie Shovels—the operators who run them all day long, or the owners of the machines. Seems to be about a 50-50 proposition between the shovel runners and the owners—because they're all strong boosters—enthusiastic!

The operator likes the Erie because it is easy to operate fast. A. L. Darrow says: "I feel as fresh and strong when I go home at night as when I start work." The Erie's simple three-lever control does away with a lot of hard labor. The automatic steam ram sets and releases the hoisting friction clutch, saving two extra lever motions on each digging stroke. That does more than save a man's strength—it *insures a bigger output.*

The owners of Erie Shovels are enthusiastic not only because the Erie gives them more output than they have ever gotten from any ¾-yard machine, but because the repair costs are so low. Although we have 400 Erie Shovels in active service, our repair business is actually next to nothing. It is the plain fact that the Erie is standing up in the toughest brickyard digging, at practically no repair expense. The reason for this is the Erie's stronger construction through and through—stronger truck-frame, stronger boom, stronger dipper-handle, larger bearings. More metal and better metal at every point of wear and strain.

We haven't told you all about the Erie Shovel, by any means. We have just got you started. If this ad gets you to talk to some experienced Erie owner, then you will get the whole story. Only an Erie owner can tell you how good the Erie is.

Find out which is the best revolving shovel on the market. Write for a list of Erie owners near you, and for a copy of our new Bulletin "W."

Ball Engine Co., Erie, Pa.

BOOKS FOR CLAYWORKERS.

These Books will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

The Clayworkers' Handbook, by the Author of "The Chemistry of Clayworking." Price $2.00.

A manual for all engaged in the manufacture of articles from clay, containing chapters devoted to Materials Used in Clayworking, Preparation of the Clay, Machinery, Transport, Conveyors, etc., Drying and Dryers, Engobing and Glazing, Setting or Charging, Kilns, Firing, Discharging, Sorting, Packing and Dispatching, Defects, Tests, Analysis, etc., etc.

Modern Brickmaking, by Alfred B. Searle. Price $5.00.

It contains well-written chapters on the nature and selection of clays and other materials used, general brickmaking, the different processes, machinery, kilns, setting and burning, various products and uses, and sources of difficulty and loss.

Clays: Their Occurrence, Properties and Uses, by Heinrich Ries. Price $5.00.

A valuable and reliable treatise on the origin of clay, chemical and physical properties, kinds of clay, methods of mining and manufacture and distribution of clay in the United States, including a chapter devoted to Fuller's earth, its distribution in the United States, mining and uses, etc. The book is well illustrated, which adds much to its value.

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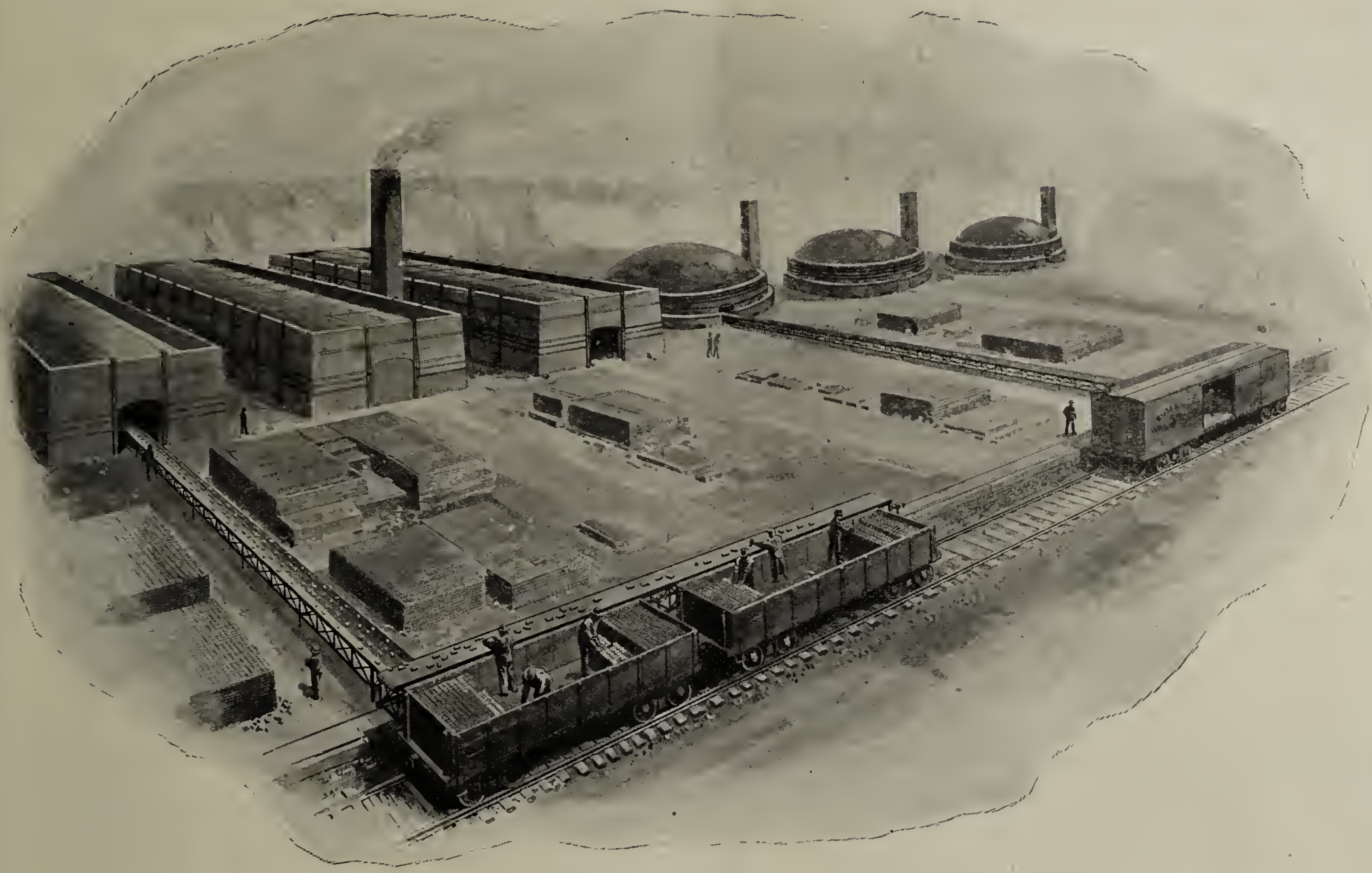

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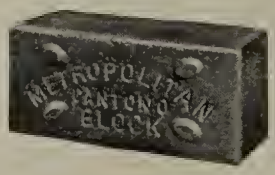

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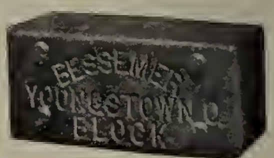

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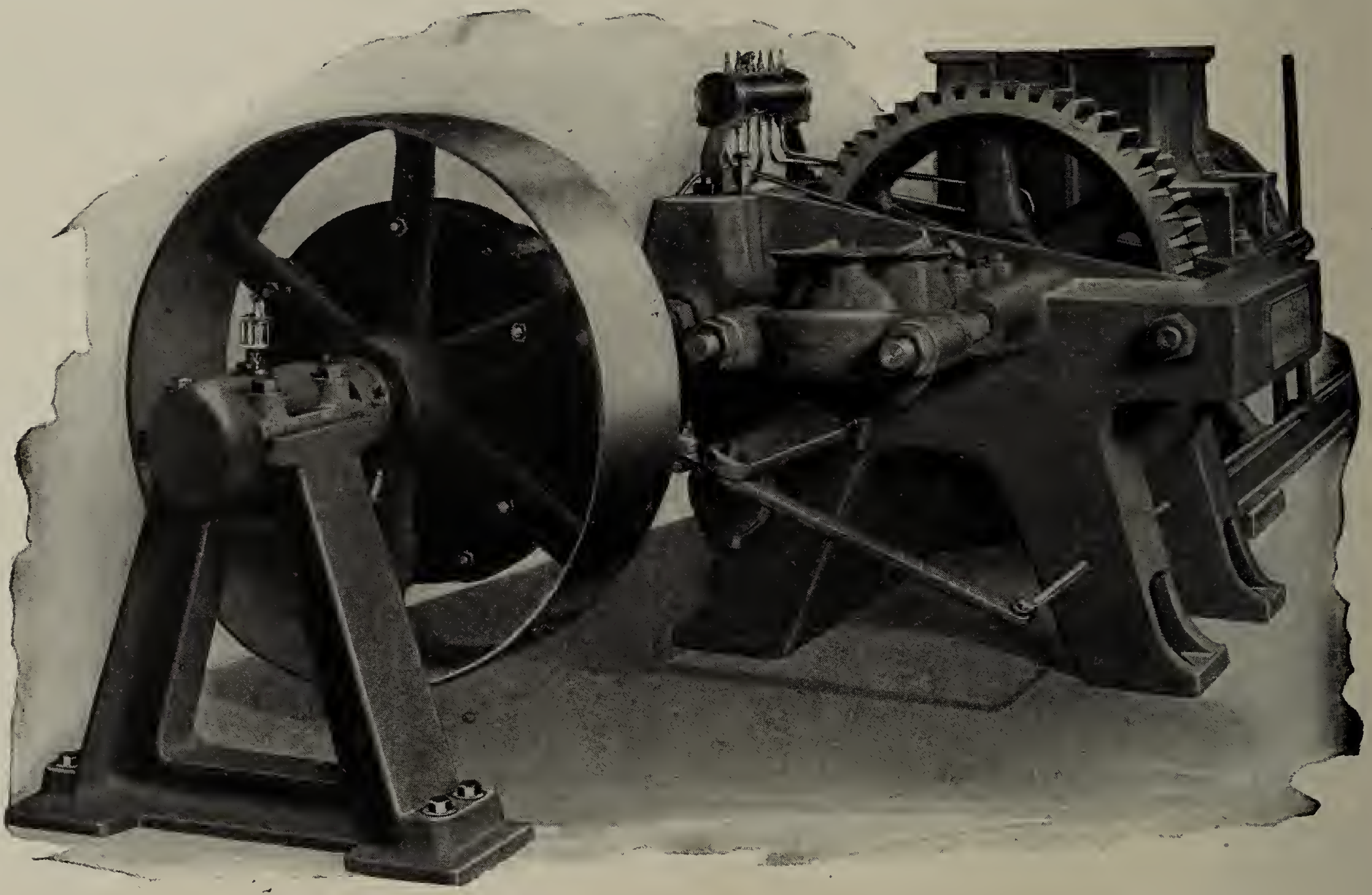

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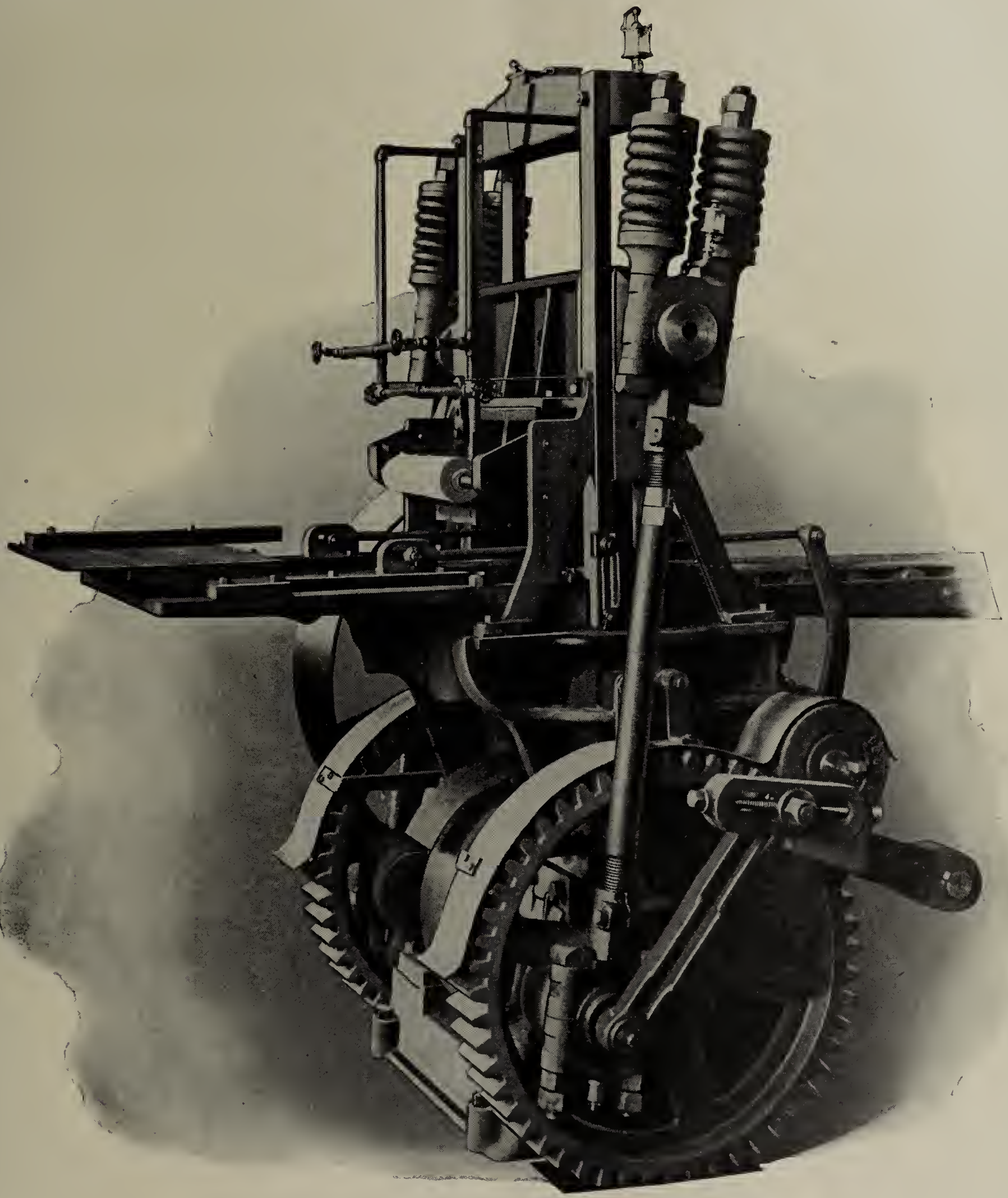

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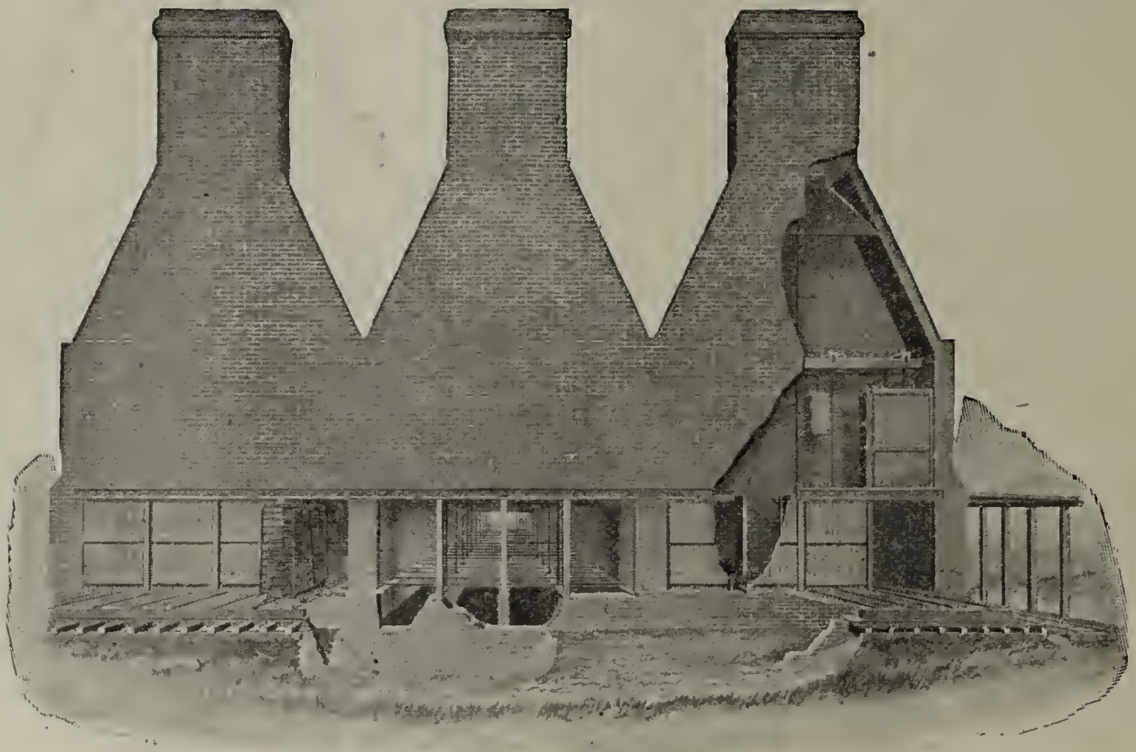

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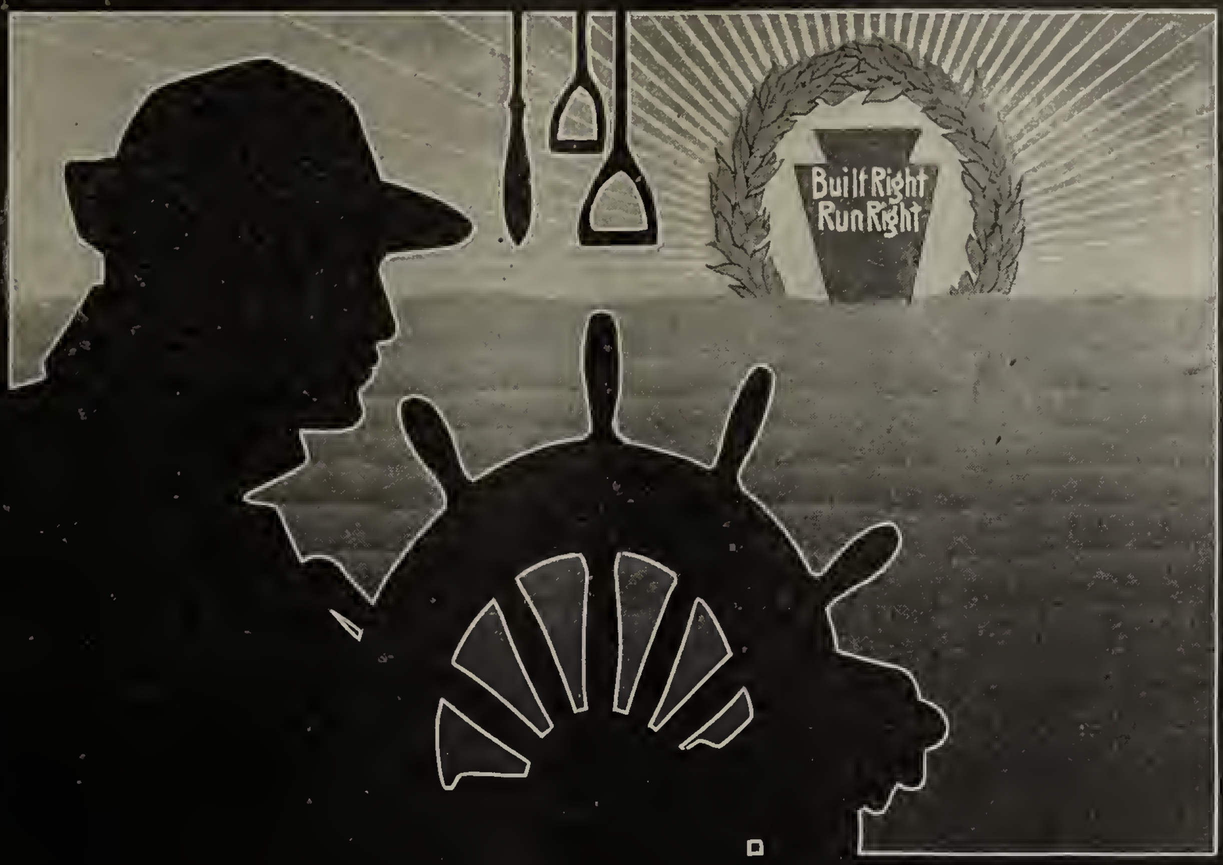

Look Out for Submarines!

Look out for Submarines in your business. There are many things that will sink your business besides explosives. Handle the wheel carefully.

High cost of production is the big "Submarine" that is laying for the Clayworker these days. "Cost" dictates the selling price and sales depend largely on your price. Watch that beacon ahead.

Your manufacturing cost can be cut in two ways. By increasing your output without increasing the cost operation and by cutting the cost of your present output. Our life buoy should be your guide.

We can do both with our machines of larger capacity and low cost of upkeep. Our Haigh Continuous Kiln will burn your product with a half the coal and will cut out half the kiln labor. The waste heat will dry your product. "Cost" is going to be important next year and we can help you cut your cost. Correspondence invited.

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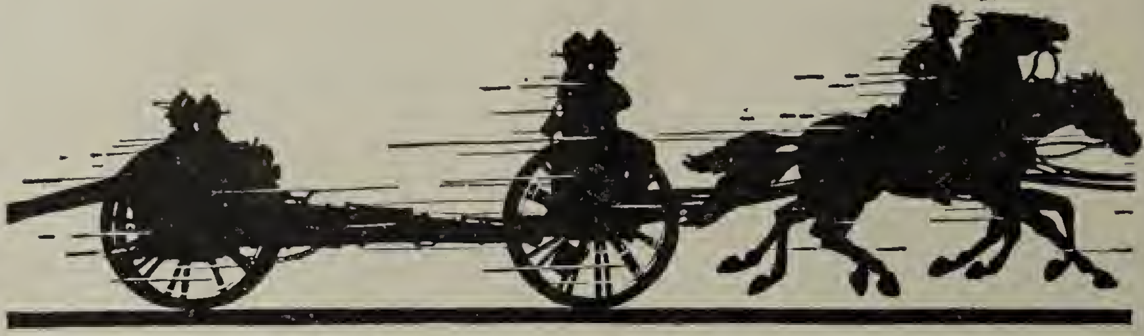

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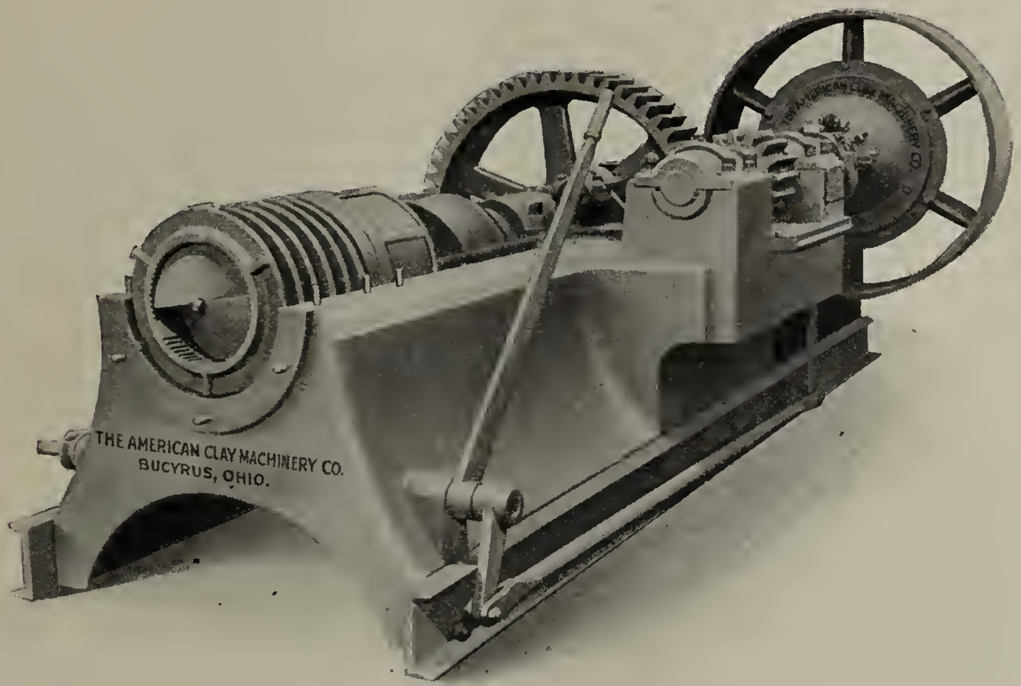

Peace" in the way of producing, at a cost that will help to continue "Business as Usual." The whole country needs saving in cost, and here is your opportunity for you to "get yours."

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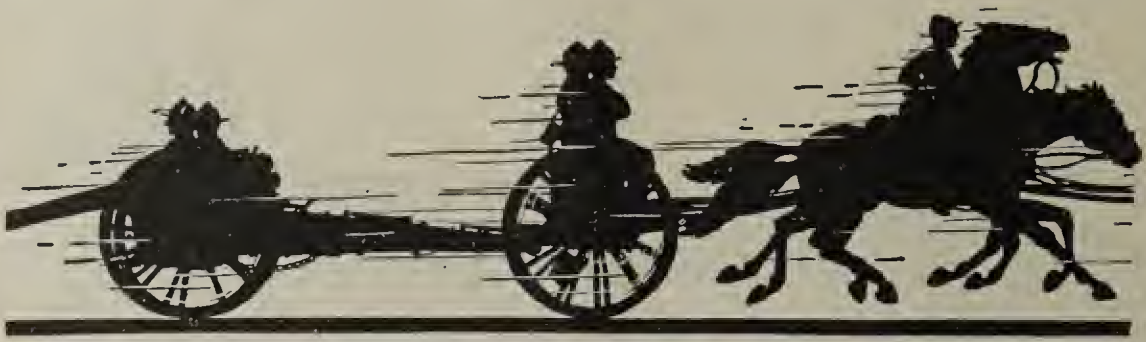

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To be Ready is half the battle, no matter whether it is in pursuit of peace or the contests of war.

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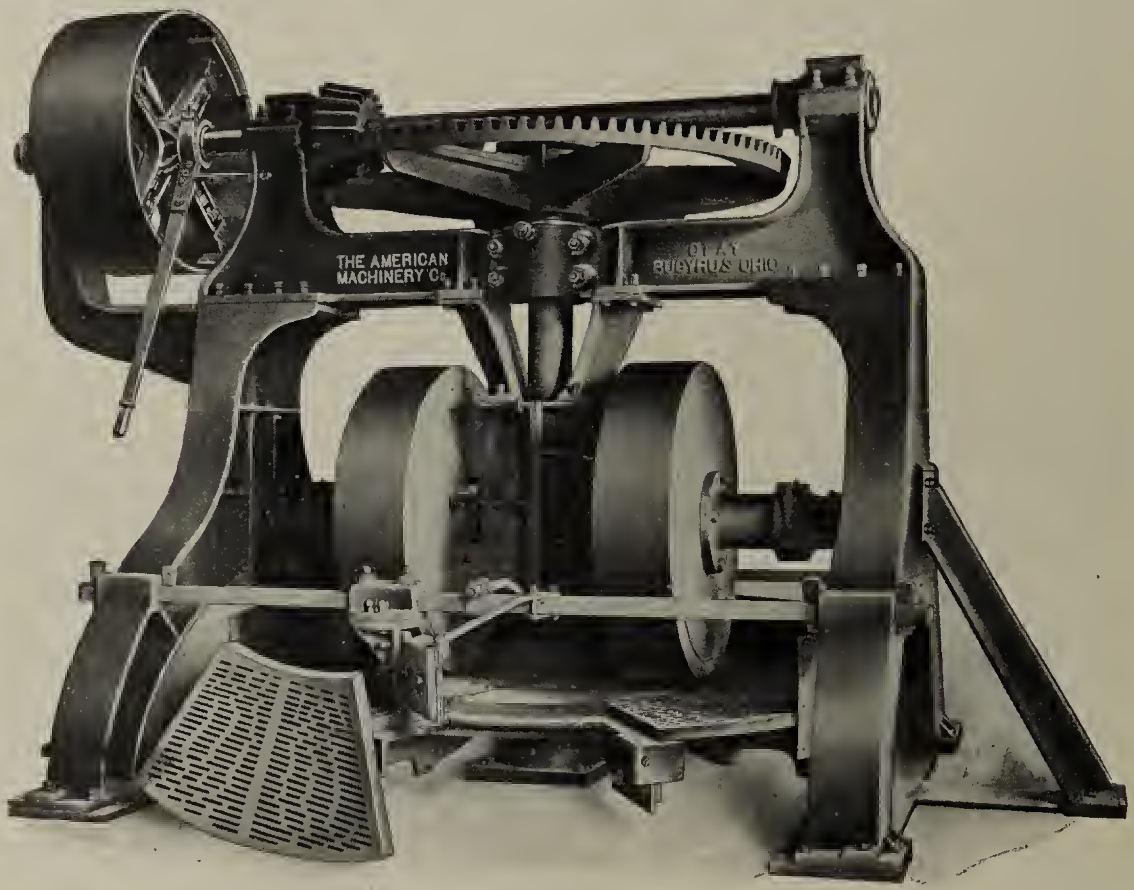

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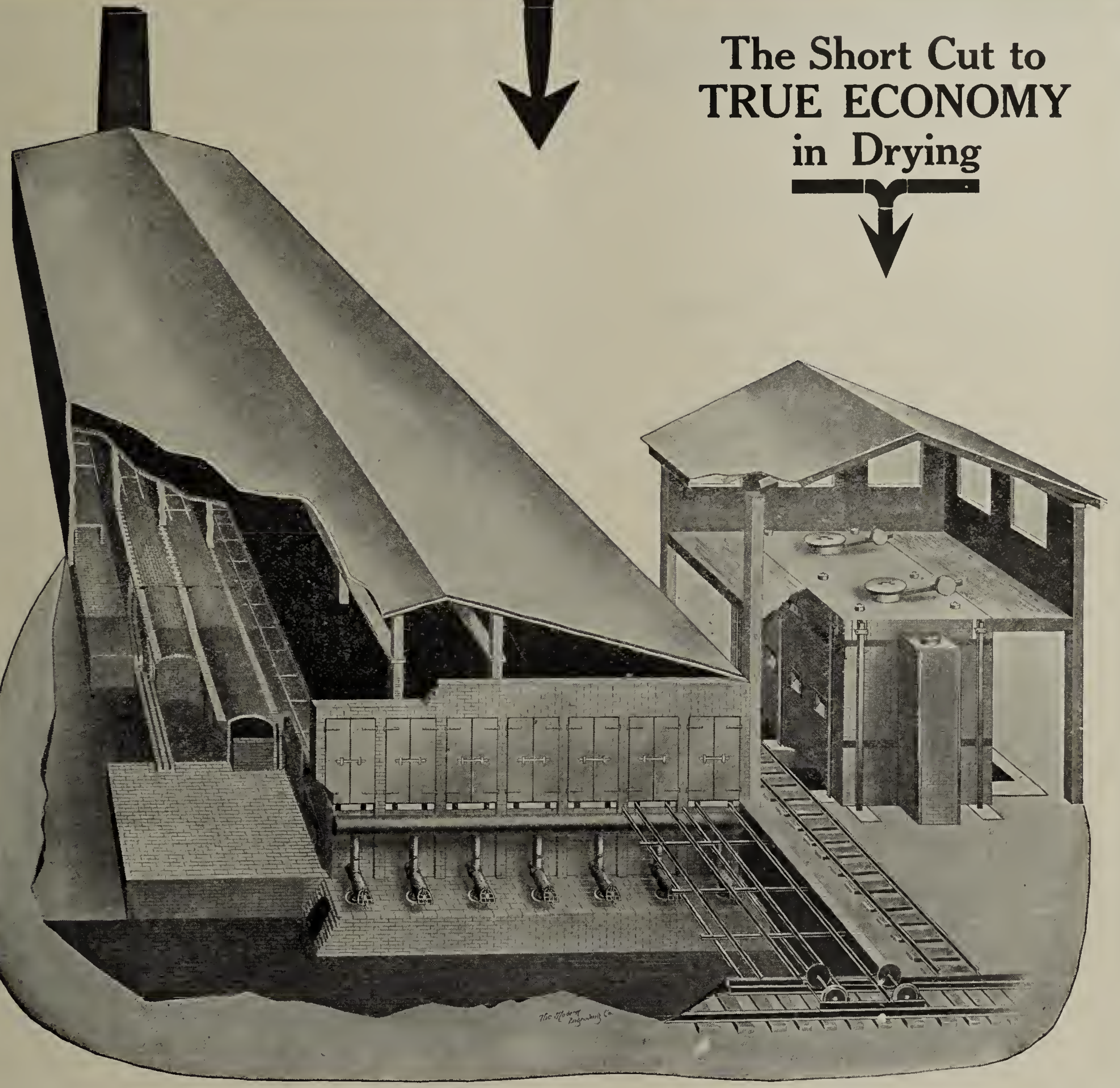

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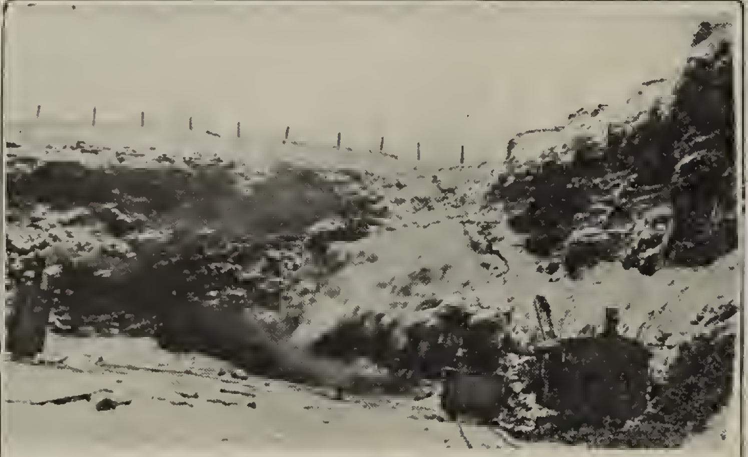

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DU PONT

BURNING CLAY WARES.

(Continued from page 527.)

equal the first, which gives us the equation, $.675\,H = 25.8 + 1.6 + .06\,H$, from which we find $H = 45$ feet.

The distance of the stack from the kiln introduces flue resistance equivalent to the stack friction per foot, which we have found to be .06.

We must introduce this into the equation and let us assume flue lengths of 15 feet and 300 feet.

For the first equation we have:
$.675\,H = 25.8 + 1.6 + .06\,H + .06 \times 15.$
$H = 46$ feet.
For the second equation:
$.675\,H = 25.8 + 1.6 + .06\,H + .06 \times 300.$
$H = 74$ feet.

In kiln wall stacks we have even higher temperatures than 1,432 degrees. Since the stack is separated from the interior of the kiln by a 4½ inch wall, or at most 9 inches, and invariably combustion gases are burned in the stack at least a part of each firing period, and the stack temperature will approximate the kiln temperature. Wall stacks then may be correspondingly low.

On the other hand, the greater the distance of the stack from the kiln, the cooler the gases and the higher the stack requirement.

The following table gives the heights for different stack temperatures, in the first column without flue resistance, in the second including 15 feet of flue, and in the third including 300 feet of flue.

Temp. in stack	Height without flue	Height 15 ft. flue	Height 300 ft. flue
432	94	95	125
632	66	67	93
832	56	57	80
1032	50	51	77
1232	47	48	76
1432	45	46	74

Stacks within 15 feet of the kiln will usually have temperatures between 832 and 1032 degrees, and stacks 300 or more feet away will have the temperature reduced to 632 degrees or less.

In working out the proper height of stack, the engineer must take into consideration and allow for a number of factors which cannot be included in a typical calculation.

The above calculations are based on the consumption of .18 pound of coal per second. An increased coal consumption will have no effect on the grate resistance, since it would involve increased grate area, but it does involve increased kiln resistance because we would thereby increase the volume of gases passing through the kiln, thus increasing the velocity which is a factor of the friction. We provide a larger stack area for increased volumes of gas, but we cannot, or do not, provide a larger free area in the kiln and therefore the stack should be higher to overcome the increased kiln resistance. On the other hand, we cannot increase the velocity of the gases through the kiln without in some degree increasing the stack temperature, and this will lower the height of stack required.

We assumed a kiln resistance based on a limited boiler test, and this may not be a reasonable assumption. Our justification is that the results approximate good practice in clay ware burning.

Our assumption, further, is for a down draft kiln, set with brick. Hollow ware would have less resistance and would not require as high a stack.

We have determined the weight of the kiln gas at 32 degrees to be .087 pound per cubic foot, and noted that the weight varies between .085 and .087, and if we use the lighter weight we increase the stack intensity and reduce the height of the stack.

Our calculations are based on coal burning furnaces, which offer resistance and require additional stack height in consequence. Where the fuel is natural gas, producer gas, or oil, it is introduced into the furnace box under pressure, thus not only eliminating furnace resistance, but actually developing a pressure available to overcome kiln resistance, lessening the work to be done by the stack and reducing the required stack height correspondingly.

The stack construction is important. The intensity of the stack depends upon the average temperature of the gases in the stack, and the temperature is lowered by increased radiation and leaks.

The situation also must be considered, the height and position of adjacent buildings or hills and the direction of prevailing winds.

The height of kiln wall stacks varies from 6 to 8 feet above the kiln crown, or a total of 18 to 24 feet. Stacks just outside the kiln walls range in height from 25 to 50 feet, depending upon the type of kiln. We have built rectangular kilns 100 feet long with stacks at the end, and the long draft flue had to be reckoned with, in deciding the height of the stack. Stacks 15 to 18 feet away from the kiln are built from 40 to 60 feet high, not considering long draft flues inside kiln, as mentioned above. When the stacks are several hundred feet away from the kiln—a single stack for a battery of kilns—the height should be determined for the most distant kiln and will be from 80 to 100 feet high.

(To be continued.)

ENGLISH POTTERY NOTES.

Some time ago mention was made in these columns of a school of science and technology worked out on a sort of co-operative basis in England, and now we are able to chronicle some of the results of the research work being conducted by this school. There, as here, there has been a call to develop possibilities of the native raw material, in lieu of some that had been imported heretofore. It was sought to produce a hard porcelain made wholly of British materials and to compound a body that would "pot" like ordinary earthenware, and it is said this result has been accomplished.

The body of the new porcelain is as cheap as or cheaper than ordinary earthenware. The glaze (leadless) is about one-tenth the price of earthenware glaze. Particular satisfaction is expressed with the glaze, which, when fired under suitable conditions, seems equal to anything yet marketed. The firing margin is very large. The oven which was built for experiments—an entirely new type—has proved a great success, and there is no reason why a development of this oven might not be used in the production of ordinary earthenware.

Little difficulty was anticipated with the fire clays, since it was known that there are many suitable fire clays in the country. The saggars used have stood remarkably well; in fact, not more than two or three saggars were lost in over twenty firings to temperatures ranging from Cone No. 10 to Cone No. 16.

Decoration with Ordinary Colors—Further Research.

The ware produced is capable of being successfully decorated with ordinary colors. People acquainted with hard porcelain know that this is not possible with some types. A great defect attaching to the Continental hard porcelain is the limitation of the colors that can be applied.

The firing of the new porcelain is the point that will be regarded most seriously by the manufacturer contemplating its production. The new ware can be fired in either "oxidizing" or "reducing" atmospheres, but the best results are obtained by the "reducing" method, which will involve important modifications in the firing practice now obtaining.

Many interesting problems in connection with the firing have arisen and much work has yet to be done. At present the experimenters are concentrating on faults in manufacture, so that the more probable sources of difficulties and losses will be known. The examination of these is necessarily slow, as it is not possible to fire oftener than once a week if they are to fire under manufacturing conditions.

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ORIGINAL BOSS SYSTEM

Drying and Burning

BOSS TEN-HOUR DRYER

Use either waste heat or exhaust steam.
No live steam. No direct firing.

BOSS SYSTEM OF BURNING BRICK

Applies to all types of kilns and will save HALF in your cost of burning.

Let us save Time and Money for you

JOHN C. BOSS CO.
Monger Bldg., Elkhart, Indiana

YOU HAVE KNOWN FOR YEARS THAT

RICKETSON'S MORTAR COLORS

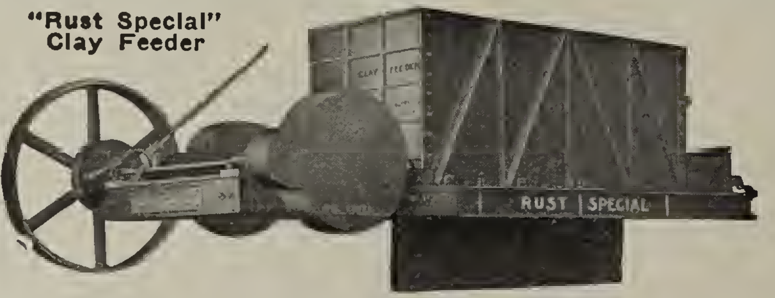
are pure and brilliant in tone, economical in application, absolutely reliable, and a permanent guarantee against fading and washing.

Why Not Insist on Having Them?

They are the acknowledged best for all uses---Mortar, Brick, Cement, Concrete and Stone.

Red, Brown, Buff, Purple and Black.

RICKETSON MINERAL PAINT WORKS
MILWAUKEE, WIS.



Tempers Clay Perfectly—Improves Product—Speeds up Plant

"Rust Special" Clay Feeder

Will help you get full capacity out of your dry pan, pug mill auger—insure a regular delivery to your off-bearers, and also cuts out labor of two men.

Ask for Rust Bulletin.

MARION MACHINE, FOUNDRY & SUPPLY CO.
P. O. 156, MARION, IND.

Kiln Band Lugs That Won't Give 'Way

Caldwell Kiln Band Lugs will never slip or give 'way because **they can't**. They do not depend on fricton to hold them. They are built on scientific principles.

Our catalogue on Tanks and Hoop Lugs will tell you all about them. We will gladly send it on request.

Prompt Shipments.

W. E. CALDWELL & CO., Inc.,
1970 Brook St., Louisville. Ky.

Caldwell TANKS AND TOWERS

Classified Advertisements

FOR SALE, WANTED, ETC.

Advertising rates in this column 25 cents a line, or 4 cents a word each insertion; about six words make a line. Cash should accompany the advertisement to insure insertion. No ad inserted for less than $1.00.

FOR SALE

FOR SALE.

300 brick rack cars. Inquire HERMAN ELLIS, Perth Amboy, N. J.
12 1 dm

FOR SALE.

Raymond 555 brick machine, capacity forty thousand. Used very little, condition perfect. Very cheap for quick sale. Address,

BRICK MACHINE,
12 1 c Care Clay-Worker.

FOR SALE.

Fifty single deck dryer cars, 24⅜-inch gauge, wood deck, roller bearing, first-class condition. Address,

WEST VA.,
11 3 cm Care Clay-Worker.

FOR SALE.

One 66x33-inch New York blower, with direct connected engine about 15-h.p. and ¾ housing; also one 75-h.p. Chandler & Taylor engine; all in first-class order. Address OCHS,
11 3 d Care Clay-Worker.

FOR SALE.

Five thousand wood pallets; also roller-bearing brick barrows, standard size; six brick molds. Reason for sale, quitting business. Address,

P. M. F.,
Care Clay-Worker.

FOR SALE.

Or will trade for larger engines two Porter and one Baldwin locomotives, 9x14, in good working condition. Also one No. 4 revolving Thew steam shovel, in good condition.

A. P. GREEN FIRE BRICK COMPANY,
12 1 d Mexico, Mo.

FOR SALE.

Brick and tile plant located in live town of 2,000. Can sell all the tile made to local trade. Plenty of good tile clay and plenty labor. Plant consists of two kilns, shed capacity 14,200 feet, floor space, engine and boiler, pug mill, disintegrator, Benson Automatic cut off, horses, wagons, carts, etc., 8½ acres of good tile land. Located on Junction of N. Y. C., Wabash and Penn. R. R. Have coal sheds of scales, and an established retail coal business. All this at a bargain. Address for full particulars,

JEFF N. BOYLE, Agent,
Butler Brick & Tile Co., Butler, Ind.
12 2 cm

FOR SALE

One No. 25 American rotary automatic cutter and one No. 83 American rotary automatic cutter. Both in operating condition and for sale cheap.

CLEVELAND BRICK CO.,
9 4 dm Cleveland, Okla.

FOR SALE.

No. 8 Gas Producer Vaporizer Top. Eight feet in diameter. Generates its own steam. Manufactured by R. D. Wood & Company. In good usable condition.

CHARLES WARNER COMPANY,
12 2 cm Wilmington, Delaware.

FOR SALE.

Thirty-five single deck dryer cars without slats, deck 34x86, side frames 1½x4-in., channel steel 24-in. track gauge. Condition perfect. Dirt cheap at $9.50 each. Also Raymond 555 auger machine; capacity, 40,000 daily; excellent condition; cheap. Address,

DRYER,
12 1 c Care Clay-Worker.

IDEAL LOCATION, PACIFIC NORTHWEST.

One of the best equipped shale clay plants, making dry press brick, plastic face brick, hollow blocks and drain tile, tunnel dryer, down draft kilns located on transcontinental railroad in the Pacific Northwest, is for sale on terms to suit purchaser. For particulars, address

GEIJSBEEK ENGINEERING CO.,
Blake McFall Bldg., Portland, Ore.
7 tf d

DRYER CARS

For Immediate Shipment.

For Sale—50 Standard single deck cars with full cage roller bearing, 24-inch gauge, 12-inch flanged whels. Car body of 4-inch steel channel bent to shape, reinforced by cross brace; 2½x2½-inch channel deck 34x83 inches. Address

CHAMBERS BROTHERS COMPANY
12 1 L Philadelphia, Pa.

FOR SALE—TO CLOSE AN ESTATE.

A dry press brick plant, located at Cheyenne, Wyo. Sell all the brick that can be made for $11.50 per M, F. O. B. Have order for over 700,000 brick now on our books. For a brick man this is an unusual opportunity; can be made one of the leading plants, as there is a good outlet to ship. Present owners are not brickmakers. Everything about the plant in first-class order. For full particulars, address F. A. R.,
10 tf dm Care The Clay-Worker.

FOR SALE.

208—No. 3 Chambers double deck dryer cars.
2—Single transfer cars.
1—Double transfer car.
20—Ton No. 30 dryer rail.
1—No. 7 Chambers end cut machine.
1—Chambers bevel gear granulator.
1—Chambers pug mill.
1—End cut auto. cutting table with 80-ft. offbearing table.
1—Chambers disintegrator.
1—Atlas 4-valve engine, 200 h. p.
1—Eagle repress.
3—Piano wire screens.
1—Bonnot auger brick machine.
1—Bonnot 10-ft. pug mill.

CLANCY,
12 tf d Care Clay-Worker.

FOR SALE.

One horizontal high pressure boiler, 80 H. P. 60-inches by 16 feet, 52 4-inch flues, 7-16 shell, butt-welded, ½ front, with first-class fittings. This boiler is in first-class condition, guarantee to stand 125 lbs. steam working pressure. One Sturtevant 60-inch exhaust fan, right-handed, side inlet, top discharge, one Gardner 3-inch, class A governor in good condition. One Gardner duplex boiler feed pump, 4x2½x4 inches good working order. One Atlas slide valve engine 15 H. P., fly-wheel drive face 10x46, 80 feet 1 15-16 cold roll shafting, common flat boxes, flange coupling. A lot of one black unions, nipples, elbows R-L and R Globe valves, 4-inch Gate Valve, 3 and 4-inch black pipe with cast elbows, nipples, etc., one mystic flue blower, one 6-inch Plaine steam whistle. Full particulars by mail.

GLADBROOK PRESSED BRICK & TILE CO.,
12 tf dm Gladbrook, Iowa.

FINE OPENING FOR MANUFACTURING PLANTS

On Arkansas & Louisiana Midland Railway, in middle proven Gas Field. Plenty raw material; superior quality.

T. J. SHELTON, Traffic Manager,
Monroe, La.

Classified Advertisements.

FOR SALE.

One Berg Dry Press, in A1 condition.
STANDARD BRICK CO.,
12 2 d Charleston, W. Va.

FOR SALE.

We have on hand 140 of Standard double deck dry kiln cars, about 6,000 wood pallets, 2,000 steel pallets. Wood pallets are 34 inches by 10 inches. Steel pallets about the same size. Bargain. Address
PALLETS,
12 3 cm Care Clay-Worker.

WANTED, ETC.

WANTED.

Dryer cars for a Sharer dryer, gage 32½ inches. Address
HANCOCK,
10 tf d Care The Clay-Worker.

WANTED.

Double shaft augur machine. State price and give condition of machine.
B. MIFFLIN HOOD BRICK CO.,
12 1 d Atlanta, Ga.

WANTED.

Dryer cars. Must be cheap for cash. State dimensions and make. Address
INDIANA,
11 3 cm Care The Clay-Worker.

WANTED.

Fire brick salesman. Apply, giving experience, age and salary desired, to
FIRE BRICK,
11 3 d Care of Clay-Worker.

WANTED.

Foreman for sewer pipe plant, two-press shop. Must be capable of handling a press when necessary. State fully experience, give references and salary expected. Address
SEWER PIPE,
11 tf d Care Clay-Worker.

WANTED.

Second-hand dryer cars of any style or gauge, also light steel rail for trackage. If you have anything, advise price, style, make and condition of cars, also quantity of cars and rail which you have. Address
EQUIPMENT,
11 1 L Care Clay-Worker.

WANTED.

Factory manager, to assume complete charge of large fire brick plant. Must be between 28 and 36 years of age, forceful, possessed of technical as well as practical knowledge, and able to prove former success in large undertakings. Address
Q. E. D.,
11 2 d Care Clay-Worker.

WANTED.

Brick machine room and dry pan room foreman by large Missouri plant manufacturing fire brick. Prefer man who is familiar with Bonnot and Chambers machinery. State age, experience, salary expected and full details in your application. Address
PRODUCTS,
12 1 d Care Clay-Worker.

WANTED.

Dry press and pan, state size, make, condition and orice. Address, Dry Press, care Clay-Worker.
12 3 c

WANTED.

Position as foreman in brick factory or other clay industry by a man of eighteen years of experience. Address
FOREMAN,
12 2 dm Care Clay-Worker.

WANTED.

100 double-deck 22-inch gauge steel dryer cars, automatic table for curving and cutting silo tile with 50,000 capacity. American Clay, Fate or Bonnot machines all first class condition, cheap for cash. Address
NEBR.,
12 1 d Care Clay-Worker.

WANTED.

Experienced man to handle sales and collecting; to supervise office and pay roll work and superintendent the making of special moulds, for refractories in fire brick plant. Capacity 12M. State salary required and full details. Those only with reputation and experience requested to answer. Address
HIGH GRADE,
2 tf d Care Clay-Worker.

WANTED.

Position as superintendent. Have wide experience in brick, porcelain and allied lines. Address HARTFORD,
12 3 1p Care Clay-Worker.

WANTED.

A wheeling crew for moving paving blocks from kilns to cars and stockhouse. Write
C. P. MAYER BRICK CO.,
11 2 d Bridgeville, Pa.

WANTED.

Experienced kiln building foreman, sober and industrious. Excellent opportunity for the man who fills the bill. Must travel. State age, salary, where and by whom employed or no attention paid. Address
J. O. T.,
12 1 d Care Clay-Worker.

WANTED—EQUIPMENT.

One crusher.
One 9-ft. dry pan.
One large brick machine.
One large automatic cutter.
Two Richardson represses.

Please give detailed description, condition, location and lowest cash price.
LOCK BOX 727,
12 tf d Uhrichsville, Ohio.

FOR SALE.

All the brickmaking equipment of the Indiana Brick Company, Anderson, Ind.. including 13 ton locomotive, rails, trucks, motors, belts, belt conveyors, blowers, pumps, hoists, etc. Plant in full operation within 90 days. All machinery in fine condition, plant being dismantled, and all equipment will be sold at low prices.

If interested, write for detailed information to
J. L. MOORE, Muncie, Ind.,
care Moore Mfg. Co.

CLAYWORKING LOCATIONS

Unusually fine deposits of clays available for a wide variety of products, and near to points where the demand is heavy, give opportunities for new plants in the territory served by the Southern Railway System.

In Southern Illinois and Southern Indiana the clays are suited to making common, fire, paving and fine brick, sewer pipe, drain, roofing and building tile, terra cotta, pottery, conduits, paper sizing, chemical apparatus, flower pots, and other products.

The Southern Railway System Development Service will help you find the location you desire for your industry. Refer to File No. 29550.

M. V. RICHARDS, Commissioner,
Room 358, Southern Railway System, Washington, D. C.

Classified Advertisements.

Pamphlets Suitable for Distribution by Paving Brick Manufacturers

VITRIFIED BRICK THE BEST MATERIAL FOR SURFACING PUBLIC HIGHWAYS, by Herbert S. Casson.

BRICK PAVEMENTS AS AN INVESTMENT, by W. T. Blackburn.

IDEAL ROADWAYS, by T. A. Randall.

TRUTH IN NEW JERSEY CEMENT ROAD WORK.

STANDARD RATTLER TESTS FOR PAVING BRICK.

FACTS ABOUT ASPHALT PAVEMENTS.

Specimen copy of any one of these pamphlets sent on request. Price in lots of 100, $3.00. Will quote you prices on larger quantities.

T. A. RANDALL & CO., Inc.
Indianapolis, Ind.

FOR SALE.

Books for brickmakers. Inexperienced workmen will find them a source of valuable information. "Clay Glazes and Enamels," $5.00; tells how to glaze and enamel brick and gives valuable recipes. "The Effect of Heat Upon Clays," by Prof. A. V. Bleininger, price $2.00; a book of valuable information on burning and drying, told in a plain, practical way, and invaluable to the burner or superintendent. "Analyses of Clays," $2.00; a valuable reference book, giving analyses of well-known clays of this and foreign countries. "The Clayworkers Handbook," $2.00; a manual for all engaged in the manufacture of articles from clays. "Clays"; their occurrences, properties and uses, with special reference to those of the United States, $5.00. Any or all of these books mailed postage prepaid on receipt of price. Write for list of other valuable books for clayworkers. Address

T. A. RANDALL & CO.,
Indianapolis, Ind.

PHILLIPS & McLAREN CO.

PITTSBURGH, PA.

Builders of
Pittsburgh Standard
Dry and Wet
Grinding Pans
for Brick, Terra Cotta,
Sand, Cement, Ore,
Refractories, etc.
Also
Rock and Ore Crushers.

When writing for prices state kind of Clay or Material to be ground and capacity desired.

Eastern Sales Office
Stephen Girard Bldg.
Philadelphia, Pa.

$2.00 THE CLAY-WORKER ONE YEAR (IN ADVANCE) **$2.00**

Anchor Brand Colors

For Mortar Cement and Brick.

BROWN, BLACK, RED AND BUFF.

Strongest and Most Durable.

Manufactured by

C. K. WILLIAMS & CO.

EASTON, PA., U. S. A.

Correspondence solicited.

Chattanooga Paint Co.,

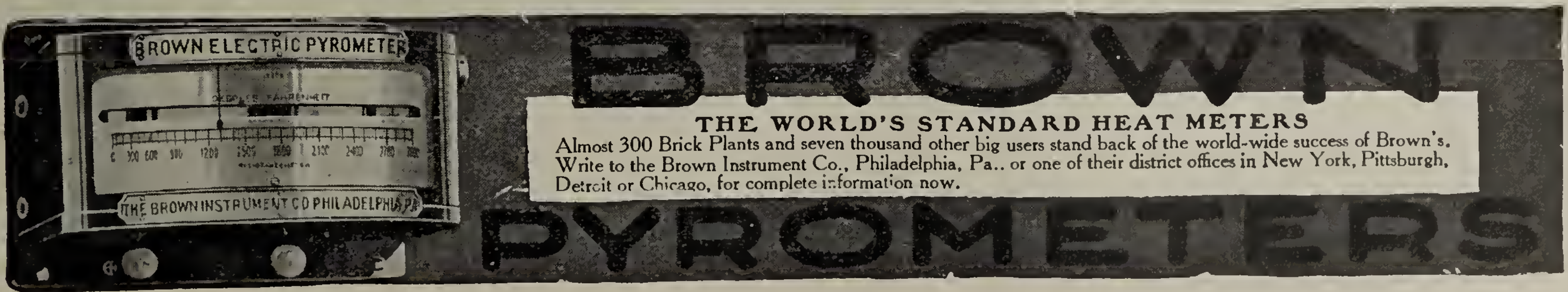
Chattanooga, Tenn.

Manufacturers of

Red Oxides for Brickmakers' Use.

ECLIPSE MORTAR COLORS,

Red, Brown, Buff, Black.


BROWN PYROMETERS

THE WORLD'S STANDARD HEAT METERS

Almost 300 Brick Plants and seven thousand other big users stand back of the world-wide success of Brown's. Write to the Brown Instrument Co., Philadelphia, Pa., or one of their district offices in New York, Pittsburgh, Detroit or Chicago, for complete information now.
BROWN ELECTRIC PYROMETER
THE BROWN INSTRUMENT CO PHILADELPHIA PA

If...

You Want to Sell or Buy...

Second-hand Clayworking Machinery, Tile Mills, or anything pertaining thereto.

If... You Want a Man

for any position or a position in any connection with the Clayworking Trades use the

For Sale and Want Columns of...

The... Clay-Worker

RATES

For all transient advertisements, such as "For Sale," "Wanted," etc., the rate is 25 cents a line per insertion. Average of six words to line.

The Best, Quickest, Cheapest Method of Securing Results.

Brick manufacturers who have anything in the way of second-hand machinery or appliances, will find a ready market for same through a card in our Classified Advertisements. Superintendents, yard foremen, burners, etc., desiring to make a change, will do well to run a Wanted ad in our classified department. Clay-Worker ads bring results.

The Yates Patent Down-Draft Kiln Also Continuous Down-Draft.

If you want to pay dividends, build modern kilns, as good burning is the keynote to success. Eighteen of my kilns are in operation at the Shawmut Vitrified Paving Brick Works, Shawmut, Pa. Come and examine results for yourself. Other references given if desired.

This kiln is operated by natural draft without a damper, and for color, uniformity and economy of fuel it is unexcelled.

ALFRED YATES,
SHAWMUT, PA.

OAK HILL GAS RETORT AND FIRE BRICK WORKS

The Parker-Russell

Mining and Manufacturing Co.

ST. LOUIS, U. S. A.

Fire Clay and Silica Products of Quality for Service---
Especially for Kiln Construction.

Machine-Molded Gears

One to 6-inch pitch and larger. Our machine-molded gears last longer than others, give higher efficiency under actual scientific tests, and in many cases cost no more than inferior gears.

H. W. Caldwell & Son Co.
17th St. and Western Ave.
CHICAGO

NEW YORK CITY
Fulton B'dg., Hudson Terminal
No. 50 Church Street.
709 Main St., Dallas, Texas.

BOOKS FOR BRICKMAKERS.

ECONOMIES IN BRICKYARD CONSTRUCTION AND OPERATION
By Ellis Lovejoy, E. M., Price $1.00.

EFFECT OF HEAT UPON CLAYS,
By Prof. A. V. Bleininger, Price $2.00

DRYING OF CLAYWARES,
By Ellis Lovejoy, E. M., Price $2.00.

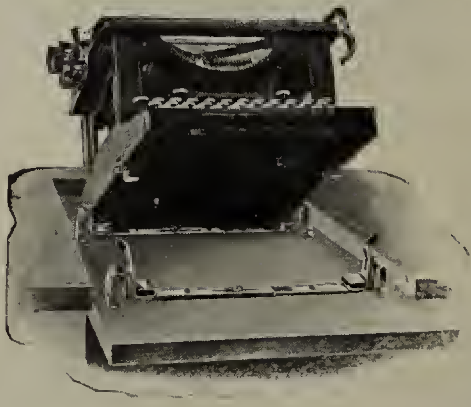
SCUMMING AND EFFLORESCENCE,
By Ellis Lovejoy, E. M., Price .50c.

MODERN BRICKMAKING,
By Alfred B. Searle, Price $5.00.

T. A. RANDALL & CO., Publishers, Indianapolis.

SILENCE YOUR TYPEWRITER

WITH A U. S. A.



It is to typewriters what springs and tires are to automobiles. It is an automatic instantaneous means for securely attaching and detaching the typewriters to and from the desk.

It is worth its price for each of the following reasons. Softens the touch, saving operator's nerves and strength. Eliminates 60 per cent of the noise. Makes better work—more uniform imprint. Is sanitary—permits cleaning under the machine. Saves ribbons, carbon paper and platen.

Make Your Stenographer Happy and Contented for only $3.50.

Agents Wanted—An Attractive Proposition

Address All Orders with Remittance to

THE MANTEL, TILE & GRATE MONTHLY
407 Arcade Building, UTICA, N. Y.

Heraeus Le Chatelier *the Ultimate* Pyrometers

Stand today as they have for the past twenty-five years as the leaders of their class.

No others are so accurate or so thoroughly interchangeable.

None are so easy to use or so practical for severe high temperature measurement. No others give the length of service that these give.

Their slightly higher first cost is due wholly to actual material involved. For example, the Platinum and Platinum Rhodium Thermo Elements are a third heavier, length for length, than most others.

The advisability of putting this extra small amount into the first cost is proven by the fact that the maintenance cost on Heraeus Pyrometers rarely exceeds five per cent.

Bulletin No. 17 TELLS YOU MORE **CHARLES ENGELHARD** *30 CHURCH ST. New York*

THE ROESSLER & HASSLACHER
Chemical Company
New York

PREVENT SCUMMING
by treating your
BRICK & TERRA COTTA CLAY PRODUCTS
during process of manufacture with our
PRECIPITATED CARBONATE BARYTES

Make Your Slogan
"SCUMPROOF PRODUCTS."
Write for literature.

BRANCHES

Cleveland,	Ohio
Chicago,	Ill.
Cincinnati,	Ohio
Kansas City,	Mo.
St. Louis,	Mo.
Boston,	Mass.
Philadelphia,	Pa.
New Orleans,	La.
San Francisco,	Cal.

HIGH GRADE CHEMICALS
COLORS and OXIDES
for
Brick, Terra Cotta
Tile, Clay Products
Also
Pottery, Glass
And Enameled Ware

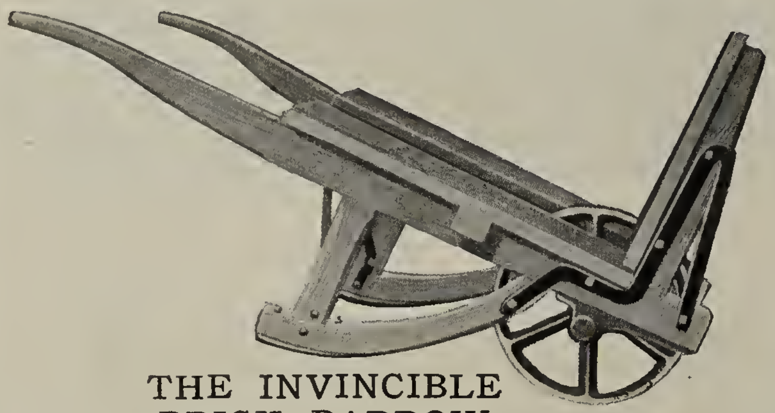
THE OREGON KILN

A semi-continuous kiln for large and small yards. Cheap to construct, easy to operate. You have perfect control of the draft and fire at all times. For information write to

A. KLOSE
277 Hawthorne Ave.
PORTLAND, ORE.

HERE IT IS--

JUST WHAT YOU NEED



THE INVINCIBLE
BRICK BARROW

Our brick barrow has been conceded to be the best on the market today. It is built of seasoned oak; has bent wood runners, wrought iron braces throughout, cast iron slide shoes and cast iron babbitted bearings.

All parts are renewable and carried in stock.

Write for information.

TORONTO FOUNDRY & MACHINE CO.
Toronto, Ohio

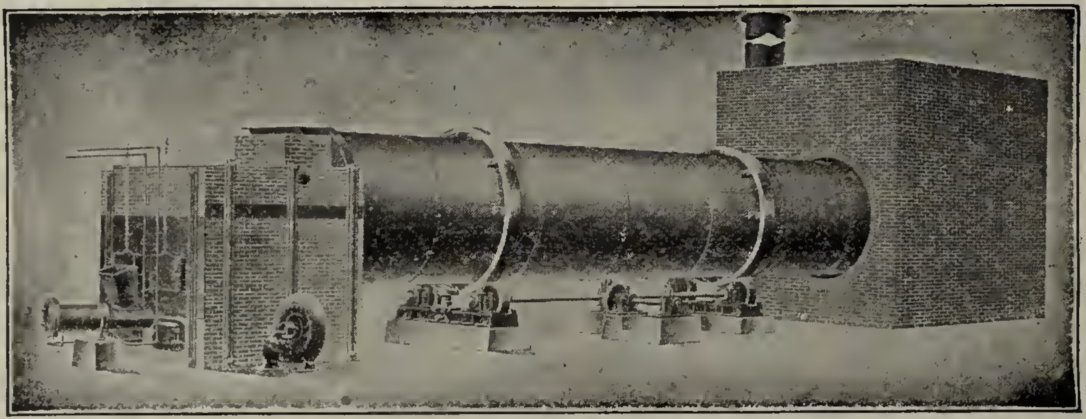
Books for Brickmakers

These Books Will be Mailed, Postage Prepaid, to Any Address in the United States or Canada, on Receipt of Price.

CLAY GLAZES AND ENAMELS	Henry R. Griffin, C. E.,	$5.00
CLAYS; THEIR OCCURRENCE, PROPERTIES AND USES	Heinrich Ries	5.00
VITRIFIED PAVING BRICK	H. A. Wheeler, E. M.	2.00
TABLES OF ANALYSES OF CLAYS	Alfred Crossely	2.00
PRACTICAL FARM DRAINAGE	C. G. Elliott	2.00
ENGINEERING FOR LAND DRAINAGE	C. E. Elliott	1.50
TILE UNDERDRAINAGE	J. J. W. Billingsley	.25

Sold By

T. A. RANDALL & CO.
INDIANAPOLIS, IND.



ROTARY CLAY DRYER
"MATERIAL CARRIED IN STOCK FOR STANDARD SIZES."

DRY YOUR CLAY

AT LOW COST

YOU CAN THEN OPERATE IN ANY WEATHER OR SEASON

It Assures Uniform Product

YOU CAN THEN SCREEN TO ELIMINATE PEBBLES, ETC.

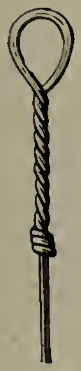
American Process Co.
68 Williams Street
NEW YORK

The World's BEST Brick Moulds

Write us.

The G. B. MENTZ CO., Wallkill, N. Y.

We Can Save You Money, Time and Trouble on WIRES



Let us send you samples and prices.
Daily capacity, 20,000 finished wires.

The Mittler Wire Mfg. Co.
Robbins, Tenn.

GOLD MEDAL AWARD

Panama=Pacific Exposition
for

THWING
HIGH RESISTANCE MULTIPLE RECORD
PYROMETERS

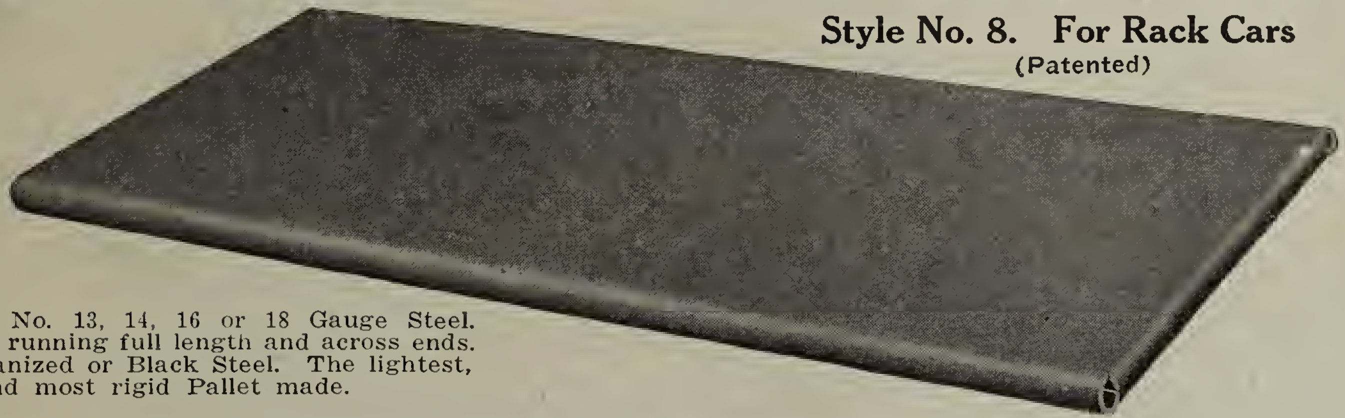
Their Merits are Vouched for by Hundreds of Satisfied Users

Ask for our New General Catalog No'.

THWING INSTRUMENT CO.
Lancaster Ave. and Cuthbert St., PHILADELPHIA, PA.

"OHIO" ROLLED EDGE STEEL BRICK PALLET

Style No. 8. For Rack Cars
(Patented)



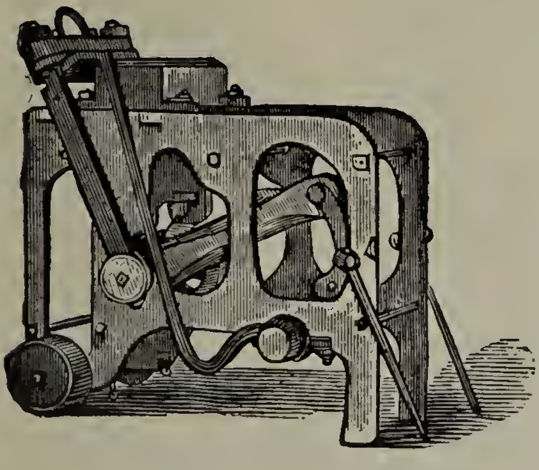
Made from No. 13, 14, 16 or 18 Gauge Steel. ⅝-inch Roll running full length and across ends. Either Galvanized or Black Steel. The lightest, strongest and most rigid Pallet made.

THE OHIO GALVANIZING AND MANUFACTURING CO., Niles, Ohio

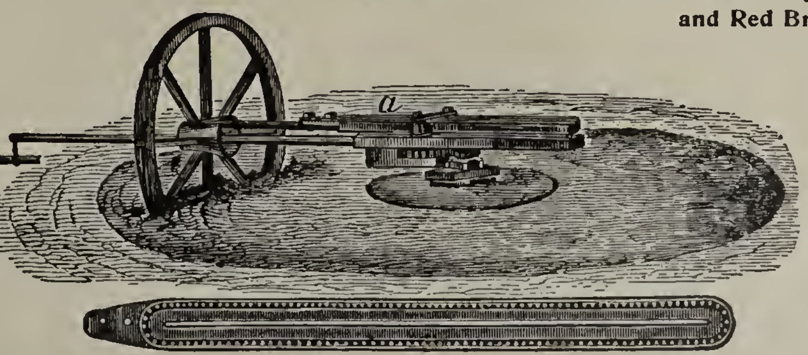
Philadelphia Brick Machine Works.

Fire and Red Brick Presses All Sizes. Machinists and Engineers.

Manufacturer of All Kinds of Machinery Used in the Manufacture of Fire and Red Brick.



RED BRICK PRESS.



These Tempering Machines can be driven either by Steam or Horse Power. The latest improvement requires less power to run than the old style Steam Gearing, and fitted up 10 per cent. cheaper.

☞Send for Circular and Price List.

GEORGE CARNELL, 1819, 1821 and 1823 Germantown Ave. and Fifth St., PHILADELPHIA, PA.

Result of 20 Years' Burning Experience

Geijsbeek Perfection Kiln

Most Uniform Burning Kiln on the Market.

Saves fuel, saves waste, saves labor.

Makes output first grade product.

Eliminates soft burns and seconds.

Adapted for any kind of Clay product, in round, square or continuous kilns.

Write for information and details.

GEIJSBEEK ENGINEERING CO.
45 Fourth St., Portland, Ore.

HOLES

SOLD and GUARANTEED

It's The

Perfection Clay Screen

Sold strictly on merit and results and on an entirely new plan that purchaser only pays as results are actually obtained in saving over former method.

Stop that HOLE where gold dollars leak out in your plant, make greater capacity, better product

At Less Cost.

We guarantee it. Write us today.

DUNLAP MFG. CO.
BLOOMINGTON ILLINOIS

Type 0 Thew Loads Clay for 264,000,000 Brick in 9 Years
Type 3 Thew Loads Clay for 397,500,000 Brick in 15 Years

The above mentioned THEW is now loading clay for 120,000 brick per day, 300 days per year, at the "F" Plant of The Farr Brick Company, Cleveland, Ohio.

The type 3 referred to is now loading clay for 150,000 brick every day at the "G" Plant of the same company.

A TYPE 1 THEW, IN ITS ELEVENTH YEAR OF CONTINUOUS SERVICE in one of the plants of The Barkwill Brick Company, Cleveland, O., LOADED CLAY for 31,000,000 BRICK in 1915. The engineer reports that they were SHUT DOWN BUT ONE HALF DAY during that time.

Over 300 brick manufacturers, in all parts of the country, are sending in similar testimony daily.

No wonder the owner wrote, after nearly 25 years of service, as follows: "Our shovel is not very handsome to look at, but it does its work without any trouble. I can't say anything too good for the shovel or the Thew Company." This shovel is shown in the cut.

There are certain fundamental principles in the Thew design that account for this ability to give maximum and continuous service at a minimum maintenance cost.

Buy a THEW and FREE YOURSELF from LABOR TROUBLES and the reduced output incident thereto.

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NEW YORK OFFICE, 30 Church Street

SCUMMING AND EFFLORESCENCE

BY

ELLIS LOVEJOY, E. M.

This is the finest treatise on the subject ever written. Every angle of the cause and best method of overcoming the scumming and efflorescence on brick is given in detail.

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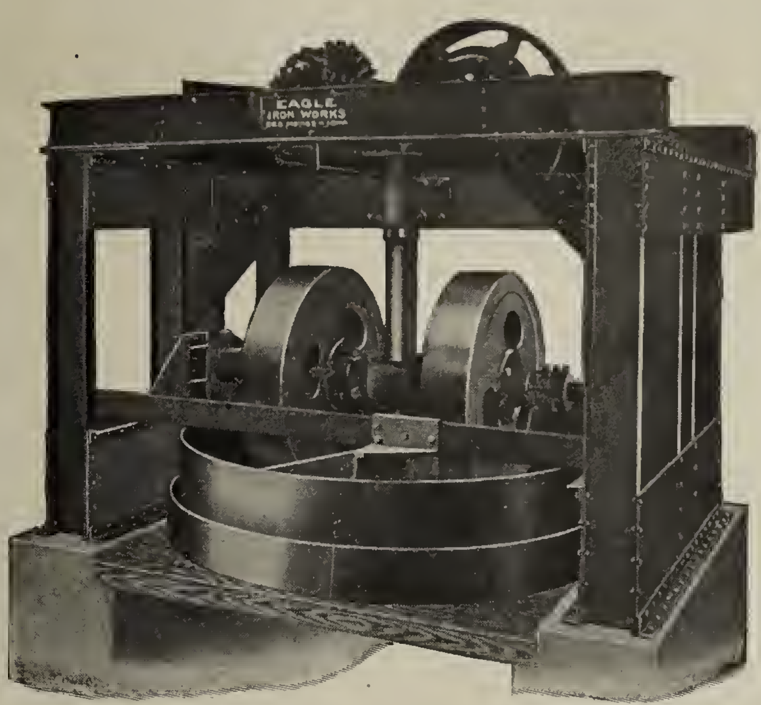
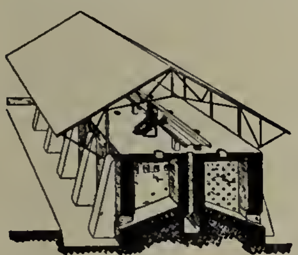


The 8 Foot Steel Frame Dry Pan

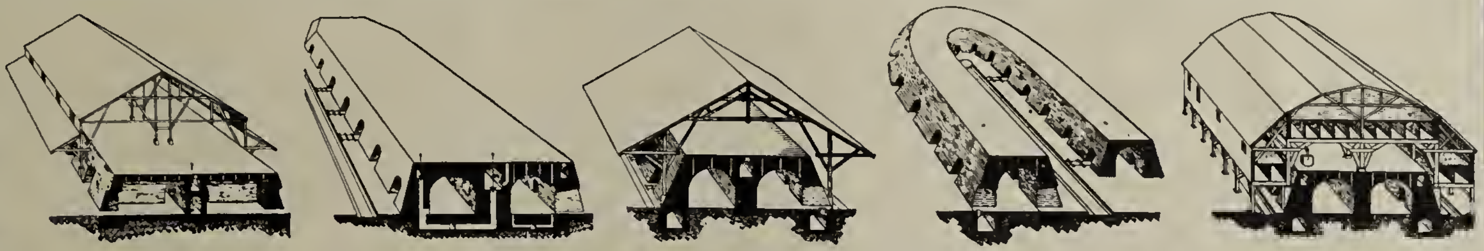
Built by the

EAGLE IRON WORKS

Des Moines, = Iowa

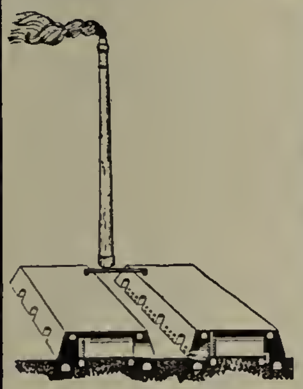


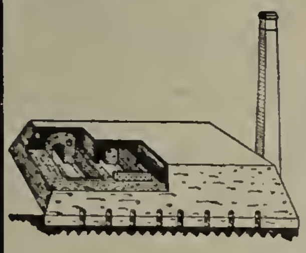
Continuous Kiln For Calcining of Clay



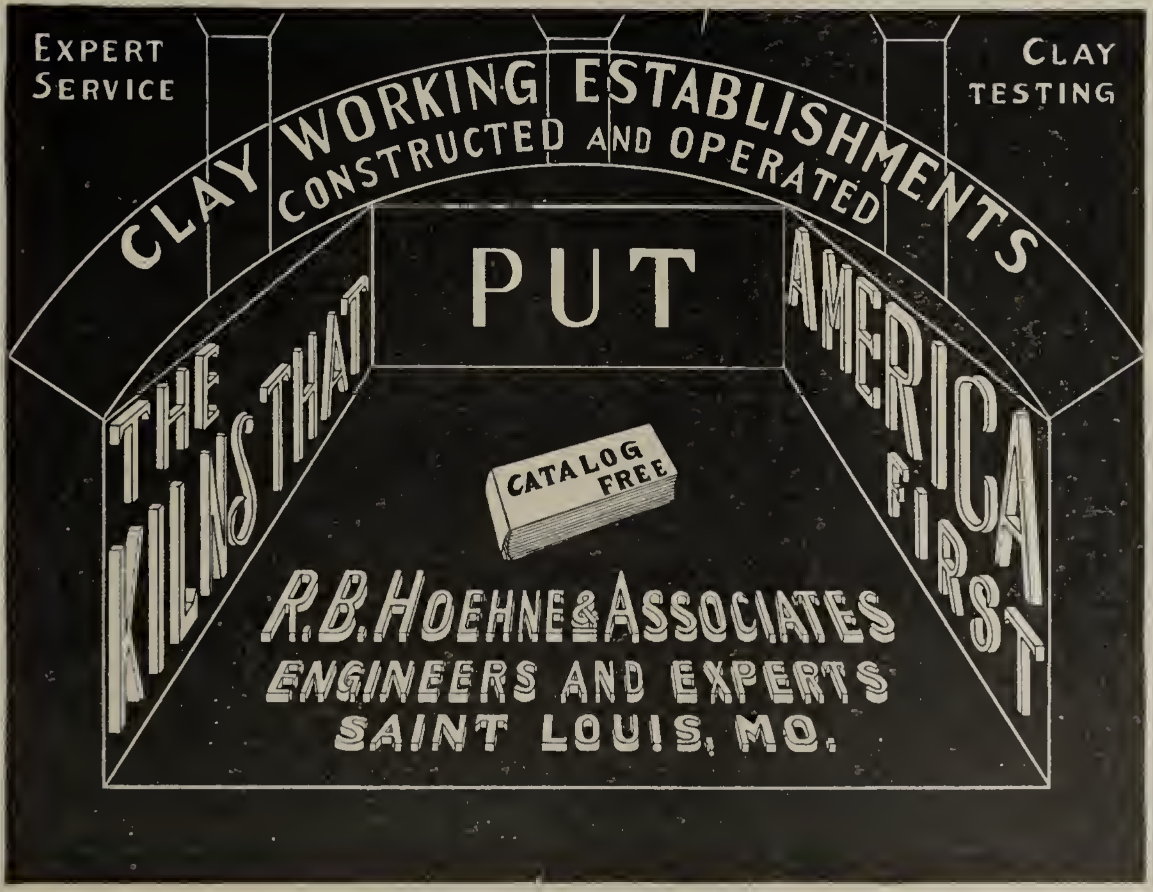
COAL-FIRED CONTINUOUS KILNS
For Burning of Building Brick, Fireproofing, Drain Tile and Face Brick

Above cut shows a Kiln with overhead Waste Heat Dryer.





Compartment Kilns for Roofing and Floor Tile, Flower Pots, Fireproofing, Drain Tile, Silo Block and Mosaic Tile.



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CLAY TESTING

CLAY WORKING ESTABLISHMENTS CONSTRUCTED AND OPERATED

THE KILNS THAT PUT AMERICA FIRST

CATALOG FREE

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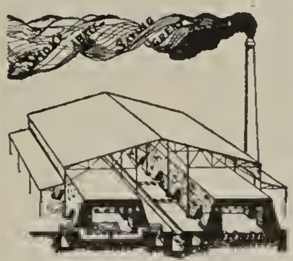
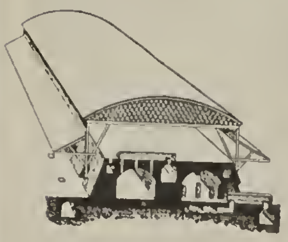
ENGINEERS AND EXPERTS
SAINT LOUIS, MO.





Producer Gas Kilns for Paving Block, Face Brick and Fireclay Products.

YOUR SERVICE IS NEEDED

An official communication says:

> "The Corps of Engineers, U. S. Army, has been authorized to raise by voluntary enlistment a special quarry regiment, to consist of six companies of 250 men each, to be known as the 28th Engineers, National Army."

We understand the regiment is to be made up of engineers, superintendents and operators of quarries and quarry machinery from all parts of the country. It offers a great opportunity for these men to show their skill and courage.

The success of the American Army operations in France is dependent on the roads and railroads. It is the duty of you skilled men to meet these requirements. Will YOU help? It's a big chance in a selective way.

Applications for enlistment should be addressed, Room 195, State, War and Navy Building, Washington, D. C.

Show this announcement to your fellow-workers, your friends, and ACT yourself.

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BUILT TO LAST

"Link up with Lakewood."
The LAKEWOOD
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DRYERS, FURNACES, KILNS

REMODELING OLD PLANTS GIVEN SPECIAL ATTENTION

DEVELOPMENT OF NEW LINES OF PRODUCTS

APPRAISAL OF PLANTS

Drying Clay Wares

By Ellis Lovejoy.

Author of

Economies in Brickyard Construction and Operation.

Scumming and Efflorescence.

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Mr. Clayworker:

Your library of ceramic literature is not complete without

DRYING CLAY WARES.

This splendid treatise covers every phase in the drying of any kind of clay ware.

It is the most valuable book of all our ceramic literature.

It is so terse and simple in its diction that it does not require a second reading to get the meaning.

The remarkable grasp of the author on this subject, his clear language, the detailed discussions and the arrangement of the subject matter make this book most interesting.

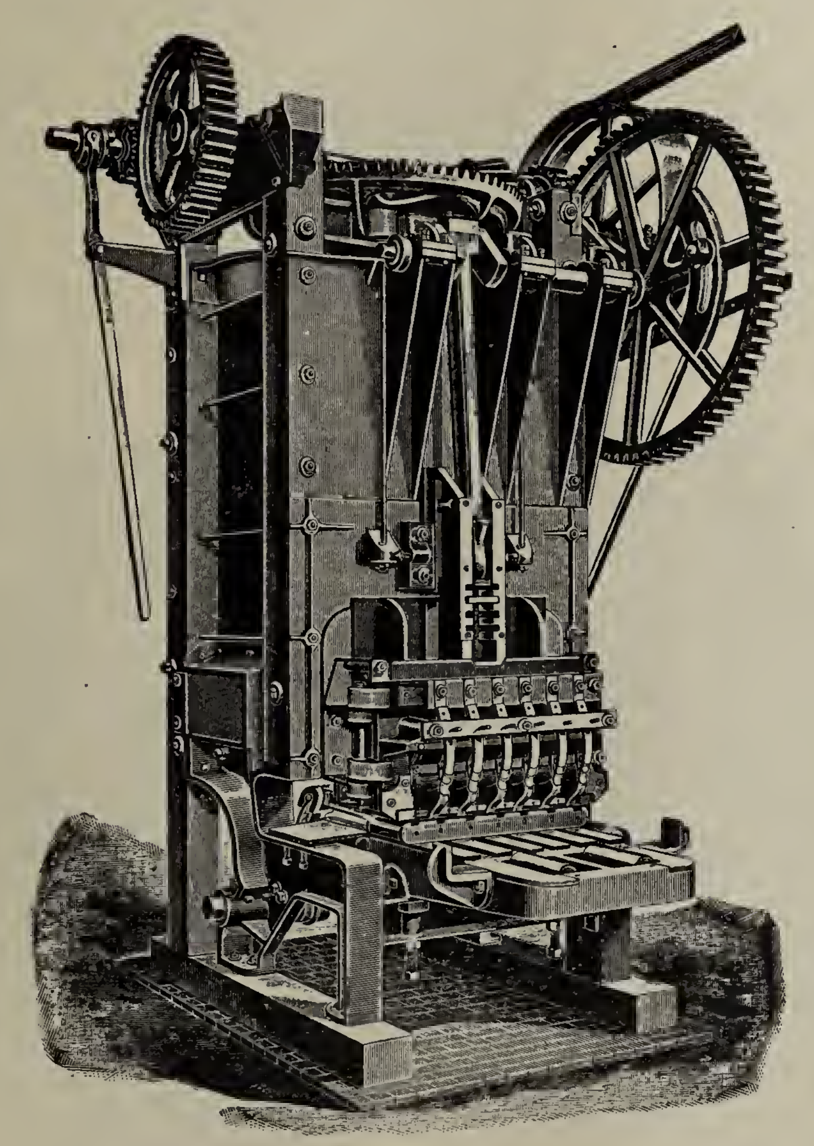
It is splendidly illustrated with sketches of the various types of dryers, etc.

The price is $2.00.

T. A. Randall & Co.
Publishers
Indianapolis, Ind.

EARNING CAPACITY

The thing which gives value to any machine is its earning capacity. The earning capacity of brick machinery depends as much on strength and thorough construction as anything. Most brickmakers have learned this in the expensive School of Experience. When a machine is broken down its earning capacity and its value is gone. Continued results, therefore, determine the economic value of a machine, rather than first cost. On this basis "New Haven" Machines have proven to be the least expensive on the market.



"NEW HAVEN" VERTICAL BRICK MACHINE.

Because of their simplicity, unusual strength and excellent construction, "New Haven" Vertical Brick Machines are seldom out of repair, and hence earn more and are much more valuable to their owners than the light weight affairs that break so often. They do better work than is possible with less powerful machines. It will pay any prospective buyer to think seriously about the matter of earning capacity, and look into the merits of the "NewHaven" Machine from that point of view.

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TURN FAILURE INTO SUCCESS

With the Wonder Machine

A Machine of Large Capacity. Unequaled in Record of Durability

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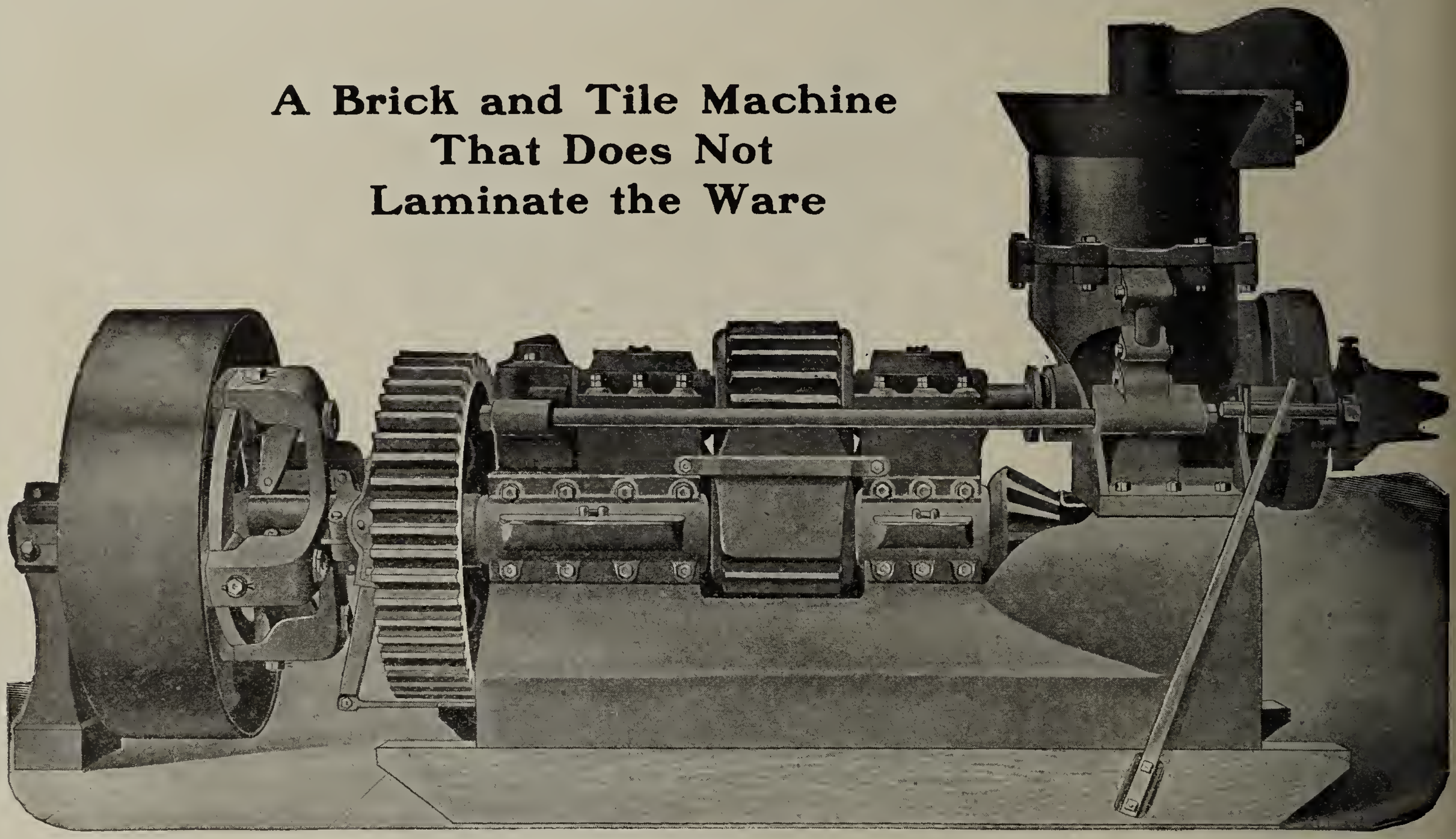
A Brick and Tile Machine
That Does Not
Laminate the Ware



The Big Wonder Brick and Tile Machine

We also make Side-Cut Brick Cutters, Clay Crushers, Dry Pans, Disintegrators, Pug Mills, Granulators and Corrugated and Smooth Roll Crushers.

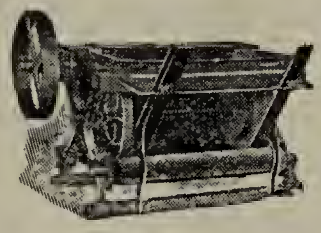
Write for Catalog and Prices.

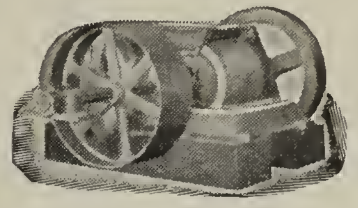
THE WALLACE MFG. CO.

FRANKFORT, IND.

Get Ready for Big Business. Purchase machinery from us and you will always be SATISFIED, as all machinery manufactured by us (C. & A. Potts & Co.) is guaranteed.

Vertical Brick Machine


Style "A" Mould Sander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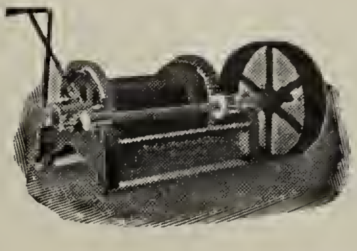
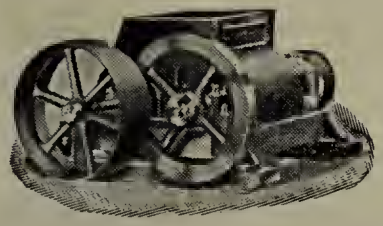
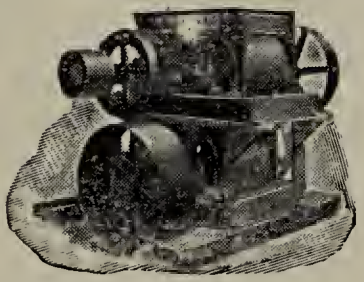
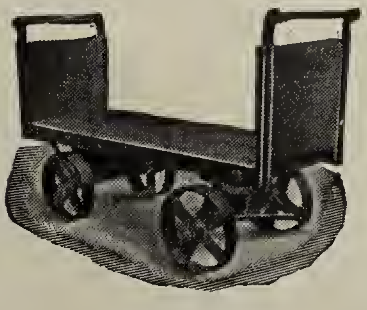

Style "B" Winding Drum

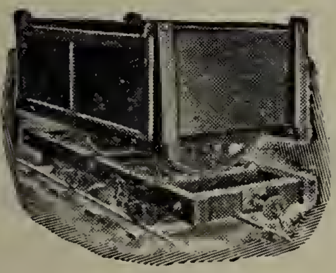

Style "A" and "P" Disintegrator

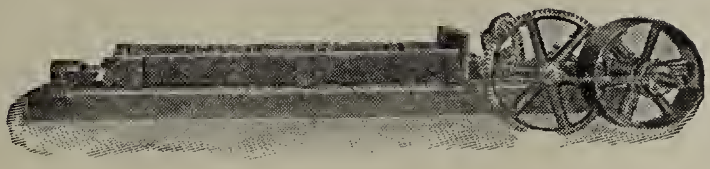

Style "P" Compound Disintegrator and Crusher


Mule Truck

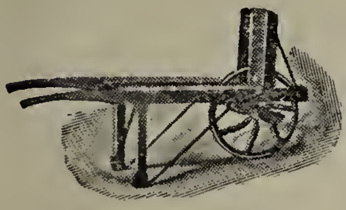
Double Geared Pug Mill

Single Geared Pug Mill

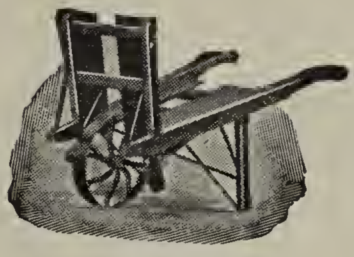

Side Dump Car


Feeder or Granulator

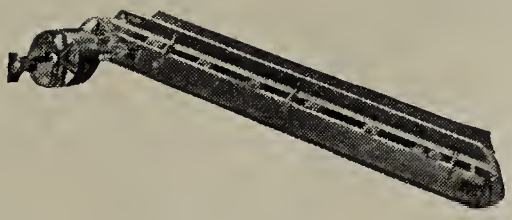
Bottom Dump Car

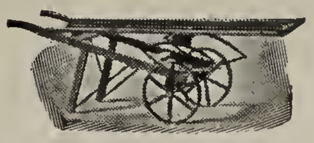

No. 6 Barrow

The Potts Rocker Grate
For any size fire box
on boiler or kilns


No. 2 Barrow

Double Deck Truck


Clay Elevator


Single Deck Truck

C. & A. POTTS & CO.

INDIANAPOLIS, IND.

Write us for Prices

If it's to be Had We Have it

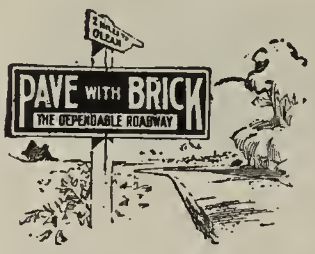
JOIN THE

BOOST BUILD WITH BRICK BOOST

CAMPAIGN

A Movement Worthy of Your Support. It Increases the Demand for Burned Clay Products, Helps to Decrease the Cut Price Evil and Stimulates the Business in General.

THE BUILD WITH BRICK MOVEMENT.



IT IS a proven fact that the public does not know the advantages and economy of burned clay products, for it stands to reason that if the average man knew that our materials were the best and cheapest in the end, more buildings and homes would be built of burned clay goods.

Our competitors have been teaching the public that clayware is a luxury and only obtainable by a large expenditure of money. The function of the Build with Brick Campaign is to combat this idea, to teach the prospective builders the many advantages of our material over others and to forcefully impress the need of building safely and well.

It is a movement worthy of your support. Remember you spend your money your own way in your own territory and get direct results. It costs but a very little to cover your section with Build with Brick signs which will work wonders for you and the trade in general.

Attractive signs go a long way toward driving home the idea you wish to convey to prospective builders. It was with that thought in view that we gave considerable time and careful study in originating our BUILD WITH BRICK posters and metal signs. The three miniatures shown on these pages are the standard signs, made 7 inches high and 20 inches long, with white embossed letters on a beautiful blue background. These metal signs are made of 38-gage sheet steel, easy to handle, will last for years and are so attractive that the pedestrian, autoist or driver cannot help but be impressed, as it stares at him from the roadway, vacant lot, or on trees, telephone poles, structures, etc.

Have you received a specimen metal sign? If not, you can have one for the asking. We will be glad to have you see one, for we know you will be much impressed. We have a contract with a manufacturing firm that enables us to quote you prices much lower than you can secure from any firm. The stock signs for "Build with Brick" or "Pave with Brick" sell for $9.00 per hundred. If you care to have your name substituted for the wording in the white space, the cost will be $9.75 per hundred. The "Drain Your Farm" sign, with firm name, costs $9.75 per hundred. Just think, 100 signs placed a mile apart along the country highways would cover 81 square miles. Think of the pulling force such a small expenditure would give you in your territory.

T. A. Randall & Co., Publishers The Clay-Worker.

Gentlemen:

You may send me........of your Build with Brick, Pave with Brick, Drain Your Farm metal signs. These are to be the stock sign or addressed with following firm

name ....

....

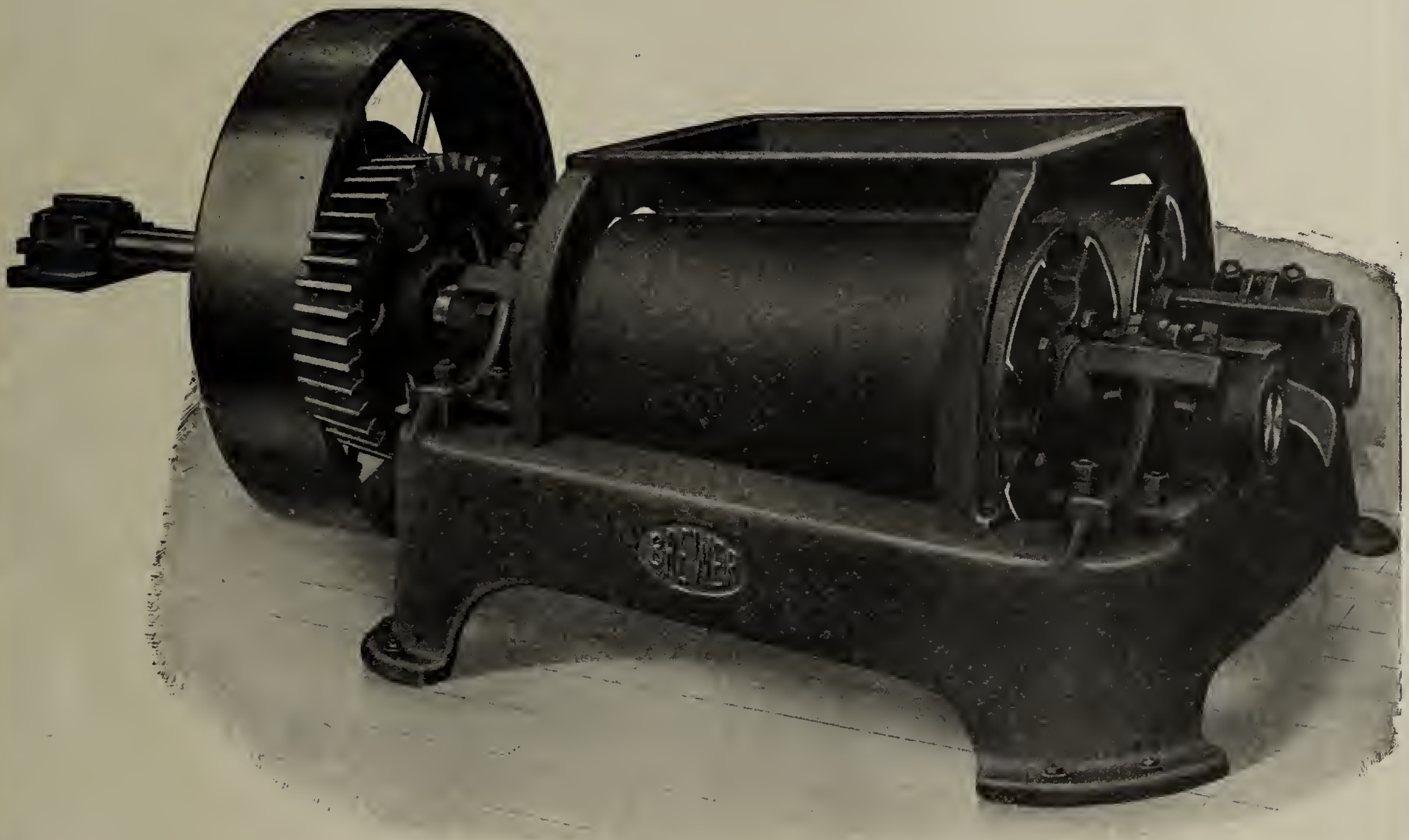
(Cross out the items not wanted, fill in and mail us the coupon.)

IF MARKED BREWER IT'S GOOD

CLAY CRUSHERS

We make a specialty of Crushers. We build all kinds and sizes—Conical, Straight, and Beaded Roll Crushers, Compound Crushers, Disintegrators and Dry Pans.

We make the rolls with removable shells and we make the shells of a special hard and durable material, which compared on a basis of cost, outwears manganese steel or anything else.



But Crushers are only a small part of our line—we also build

Brick Machines, Drain Tile Machines, Automatic Cutters, Pug Mills, Granulators, Hoists, Conveyors, Etc.

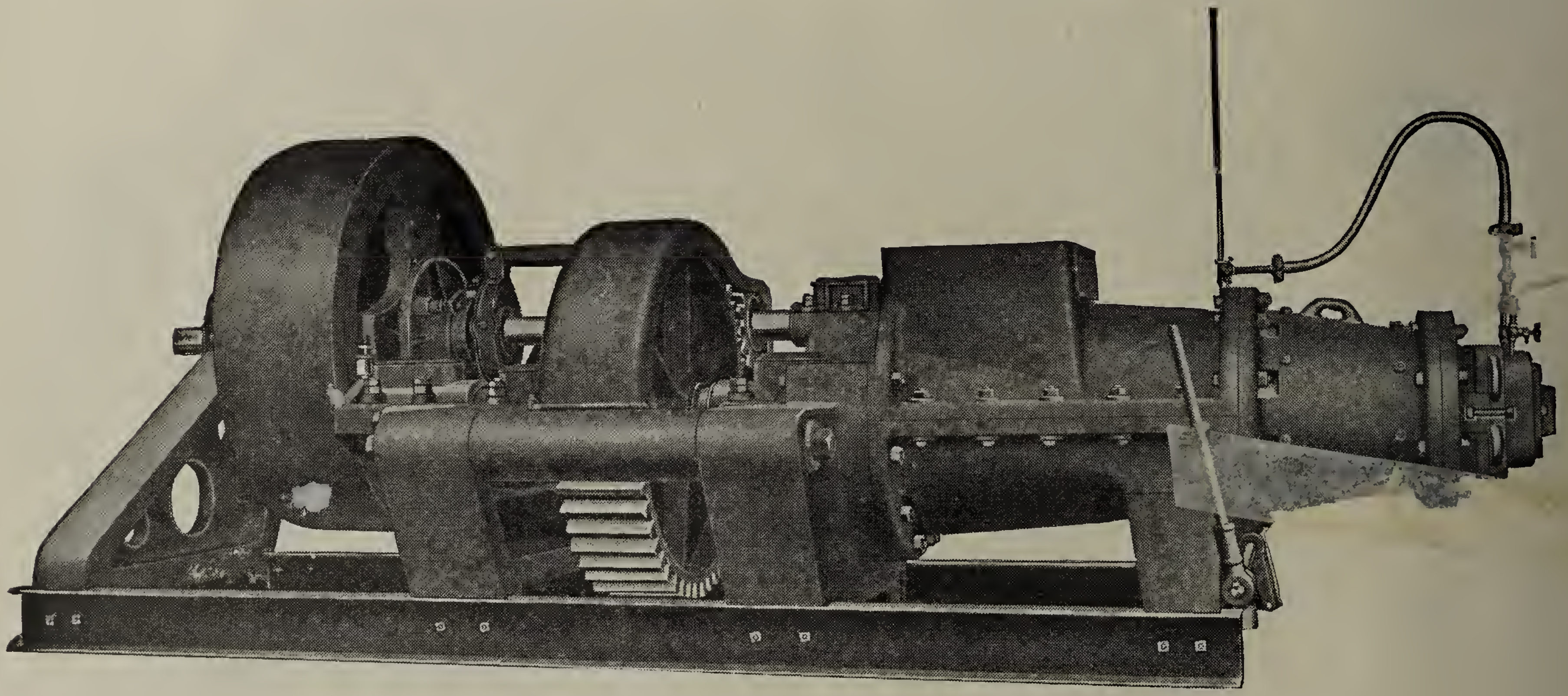
GET OUR COMPLETE CATALOG.

H. BREWER & CO. BREWER **Tecumseh, Mich.**

AT LESS THAN A CENT A POUND

Go into almost any plant equipped with an old style compound-geared brick machine; stand at the machine room door, and listen to the noisy pounding of the brick machine gears. Lay your hand on the machine and feel the intense vibration—the severe racking to which the machine is being subjected——

At a fraction of a cent a pound, this pounding and vibration—responsible for an excessive repair and power expenditure—is costing many times a fair return on the investment necessary for a modern machine.



Model GC Auger Brick Machine

A powerful quick-repair machine with no gear running faster than 125 R.P.M.—smooth running and economical—naturally.

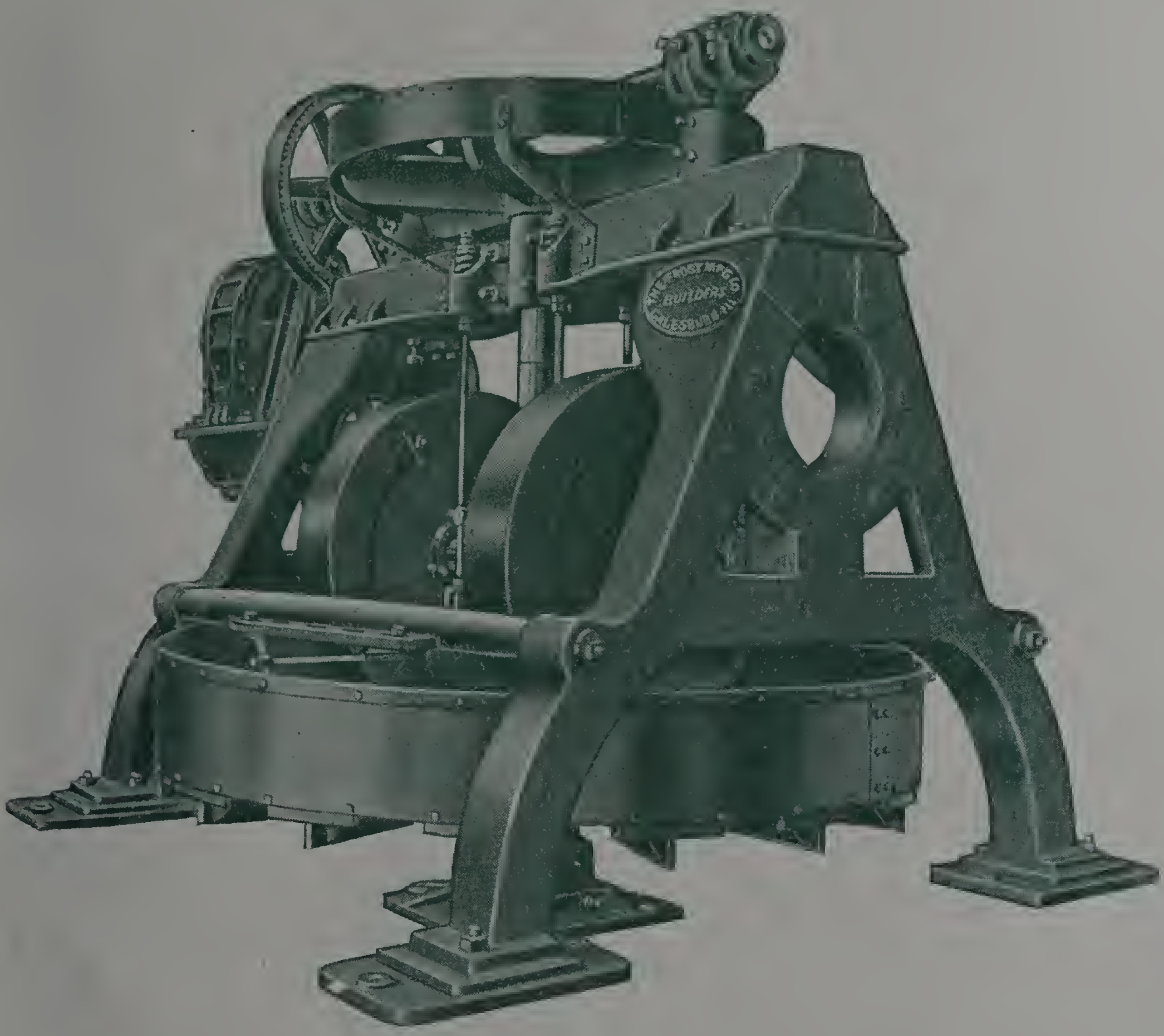
E. M. FREESE & COMPANY

Galion, Ohio

DEPENDABLE MACHINERY OF PROVEN EFFICIENCY

FOR SIXTY-FIVE YEARS

the name FROST has stood for all that is best in Power Plant Equipment, Clay Crushing and Mixing Machinery.



We are particularly proud of the splendid services our products guarantee. And especially is this true of our 8 and 9 foot Dry Pans, which are built on honor and made to last.

Ours is recognized as

THE STANDARD PAN

and has been since we made the first one many years ago.

SOME OF OUR PRODUCTS

Dry Pans, Wet Pans, Sand Mills, Chaser Mills, Brick Rattlers, Automatic Side-Crank Engines, Automatic Center Crank Engines, Automatic Enclosed Engines for belt or direct connected service, Throttling Side and Center Crank Engines, Throttling Twin Engines, Horizontal Return Tubular Boilers, other various type boilers, Rocking and Dumping Grates, Open or Closed Feed Water Heaters, Pressure Tanks, Air Receivers, Stack and Plate Work, Complete Power Equipment.

SEND FOR OUR DESCRIPTIVE BULLETINS, ILLUSTRATING AND GIVING FULL DETAILS OF OUR PRODUCTS.

The *Frost* Manufacturing Co.

Works at
GALESBURG, ILL.

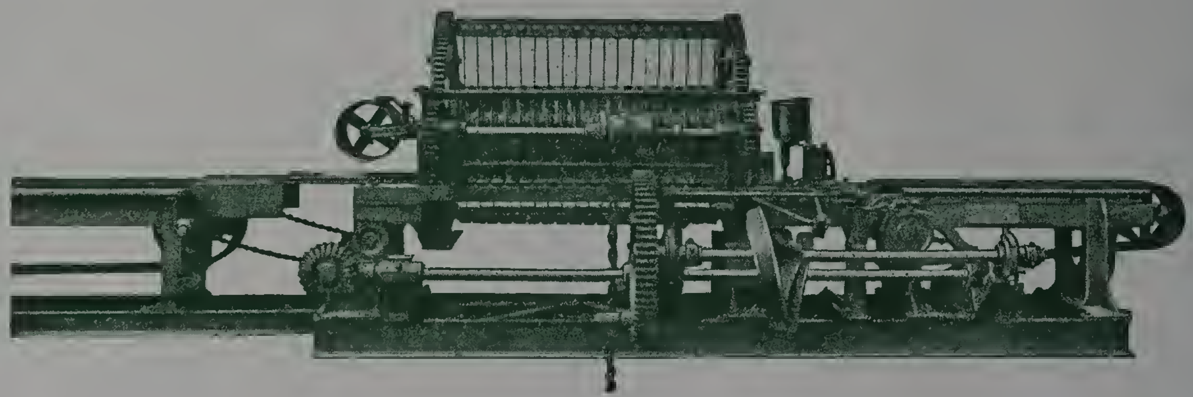
Sales Department
112 West Adams St., CHICAGO, Ill.
Cable Address, "FROSTMANCO," Chicago.

An Admirable Pair of Cutters

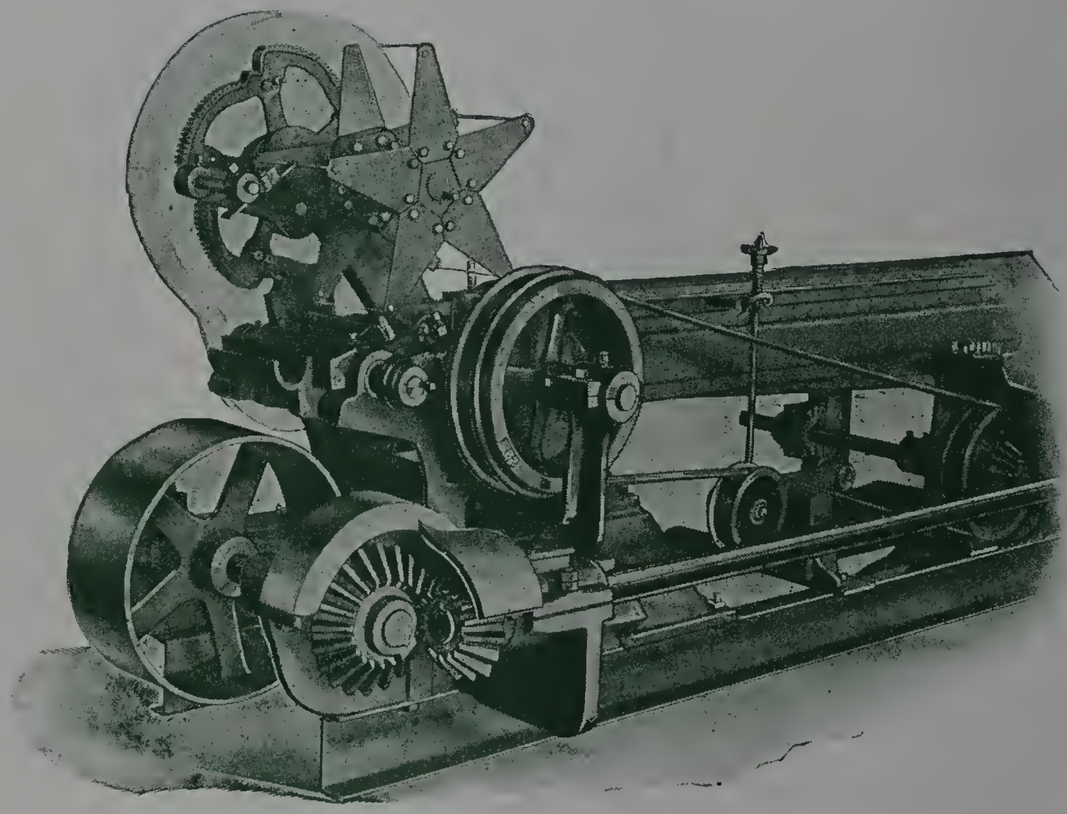
We are showing miniature cuts of the No. 18 Sidecutter and of the Rotary Automatic Endcutter. Either of these will cut any capacity up to about 150,000 per day, and do the work with greater accuracy and ease than it has ever been done before.

Dozens of these are being used with other makes of brick machine, as well as the various sizes of machine of our own manufacture.

Write for literature regarding our five sizes of Brick Machines, Pug Mills, Disintegrators, Even Clay Feeders, Crushers, Hoists, Cars, Trucks, etc.



Standard Brick Mfg. Co., Mr. H. C. Kleymeyer, Gen. Mgr., Evansville, Ind.: "The Automatic Cutter, and the Pug Mill have been giving us excellent satisfaction, and we are well pleased with the outfit." (This refers to No. 18 Sidecutter, and No. 4A Pug Mill.)



Cherokee Brick Co., Mr. W. E. Dunwody, V. P., Macon, Ga.: "I think your Endcutter is the best in existence. This is putting it about as strongly as I know how, and any stronger way to put it, write me, and I will take pleasure in affixing my signature."

HUNDREDS HAVE TESTIFIED AS ABOVE.

J. C. STEELE & SONS

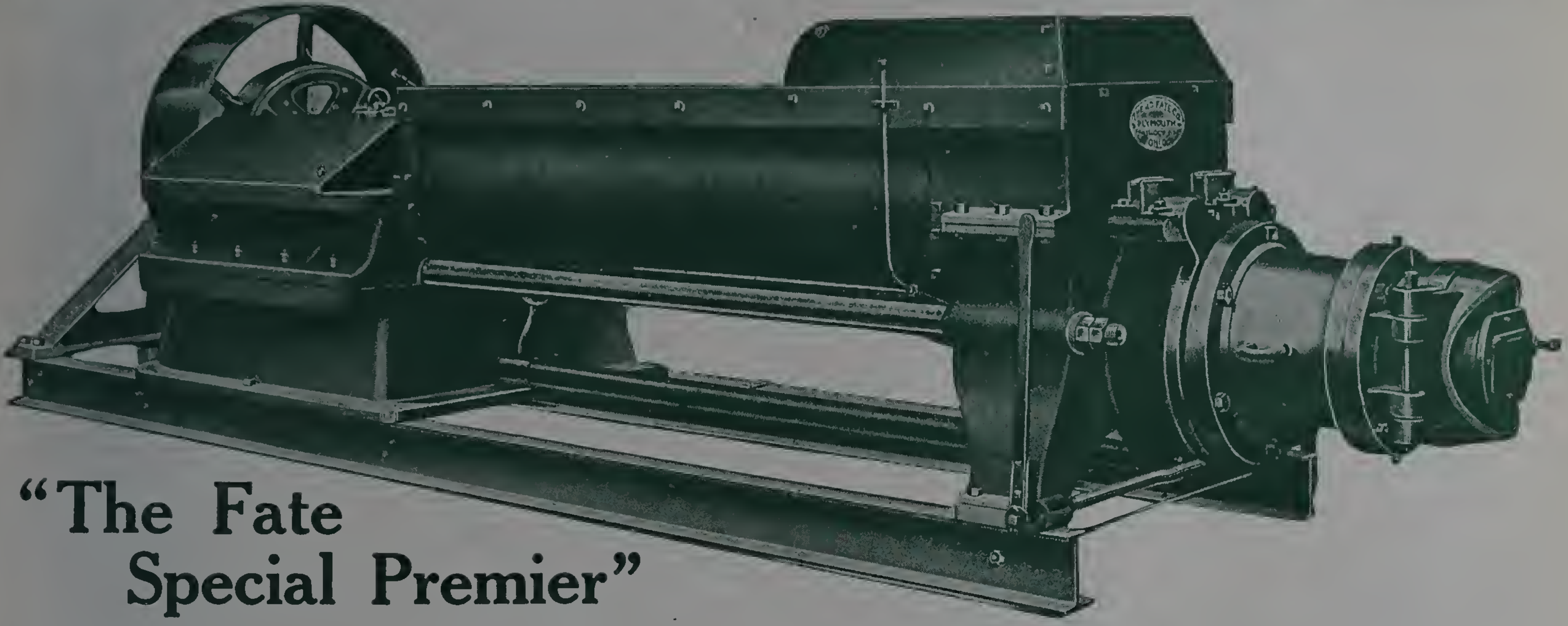
Manufacturers of Brickmaking Machinery

Statesville, N. C., U. S. A.

GEO. H. SMITH, Kansas City, Missouri,
Western Representative, 507 Reliance Bldg.

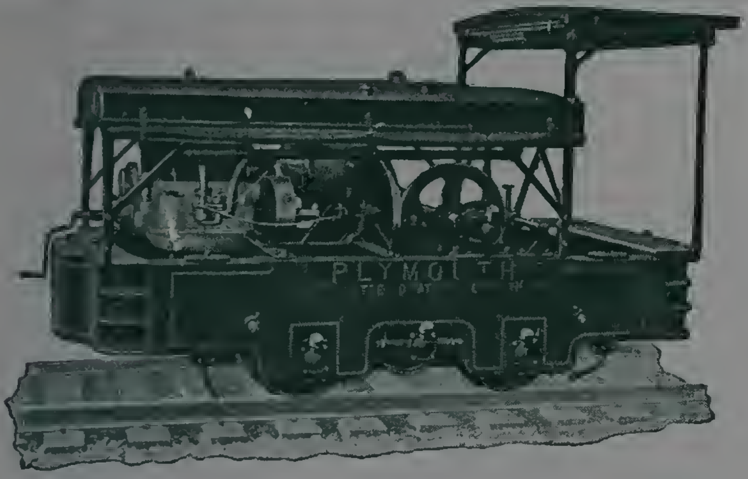
THE MANUFACTURING EQUIPMENT COMPANY.
Dayton, Ohio, Northern Representative.

The 100,000 Per Day Brick Machine



"The Fate Special Premier"

Sixty thousand to one hundred thousand Face Brick per day can be made upon this up-to-date Combination Machine, according to the condition of the clay and facilities of the plant, besides effecting a great saving in power, belting and floor space over the separate machine and pug mill.



The Plymouth Gasoline Locomotive that is hauling 100,000 brick per day at a cost of $2.85 for the Fredonia Brick Co., Fredonia, Kan.

They say:—"We have a haul of 800 feet and our PLYMOUTH has a daily duty of 100,000 brick in ten hours, these brick weigh six and a half pounds each, green.

It costs us $1.75 per day of ten hours for a common day laborer to run our locomotive, 90 cents far gasoline and 20 cents for lubricants.

This is considerably cheaper than our former method, steam hoist, we getting a cost reduction in labor, in fuel and in per ton mile.

The friction drive lives up to all claims made as to power, economy of operation, simplicity and reduction of repair bills.

We do not have a licensed engineer to run this locomotive and the expense of replacing the fibre rim on a friction drive in a year's time is much less than the cost of transmission lubricants on a gear driven locomotive."

The haulage problem at the Fredonia plant is about an average one among clay plants, as to length of haul, duty required and general conditions.

How many clayworkers using horses can haul 100,000 green brick per day at a cost of $2.85?

Write us for the very interesting book, "Cutting Haulage Costs in Half." It is free for the asking.

This **"Special Premier"** having the **Fate** double pug shaft arrangement in the pugging tub, carrying knives which revolve toward each other and interwork, making the most thorough pugging device known.

The pugging arrangement lays immediately over the main cylinder of the machine, and the pugging knives interwork with the knives of the main auger shaft, thus forcing the clay down to the augers, making a perfect force feed.

The gears are of steel running in oil in a dirt and dust-proof case.

The journals are all on the outside of the pugging tub, the rear journals being inside the gear chamber, entirely protected from the action of the clay.

This machine is furnished with an all metal friction clutch pulley, with brass bushings.

Send for our book that tells you all about this machine, and our complete equipment.

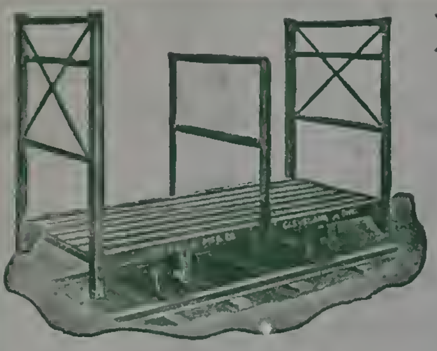
Feeders, for all kinds of clay. **Dry Pans, Crushers** and **Disintegrators, Automatic Cutting Tables** of many kinds, **Elevators, Conveyors, Winding Drums, Dump Cars, Trucks** and **Barrows,** and even the **Locomotives** to haul the clay into the plant.

The **FATE COMPLETE EQUIPMENT** will make you profit.

Allow us to furnish you the addresses of the Fate Complete Line users nearest you, so you can see who are profiting by using FATE MACHINERY.

The J. D. Fate Co.

242 Riggs Ave. Plymouth, Ohio

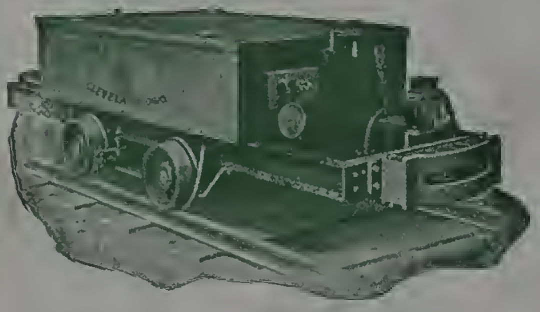


REDUCE YOUR HANDLING COSTS by the Purchase of Efficient Equipment

No. 1205
Triple Deck Dryer Car supplied with or without decks of wood or steel.

ATLAS
High Efficiency
Cars and
Electric Locomotives

Rocker Side Dump Car
Also made in end dump. Above car made for loading with steam shovel.



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